Toshiba Personal Computer

NB250/NB255

Maintenance Manual

TOSHIBA CORPORATION

Copyright

Toshiba Personal Computer NB250/NB255 Maintenance Manual

First edition April.2010

Disclaimer

The information presented in this manual has been reviewed and validated for accuracy. The included set of instructions and descriptions are accurate for the Satellite Series at the time of this manual's production. However, succeeding computers and manuals are subject to change without notice. Therefore, Toshiba assumes no liability for damages incurred directly or indirectly from errors, omissions, or discrepancies between any succeeding product and this manual.

Trademarks

IBM is a registered trademark, and OS/2 and PS/2 are trademarks of IBM Corporation.
Microsoft, MS-DOS, Windows, DirectSound and DirectMusic are registered trademarks of Microsoft Corporation.
Intel and Pentium are registered trademarks, and SpeedStep is a trademark of Intel Corporation.
Sound Blaster is a registered trademark of Creative Technology Ltd.
Centronics is a registered trademark of Centronics Data Computer Corporation.
Photo CD is a trademark of Eastman Kodak.
All other properties are trademarks or registered trademarks of their respective holders.

Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer Satellite, referred to as the Satellite Series in this manual.

The procedures described in this manual are intended to help service technicians isolate faulty Field Replaceable Units (FRUs) and replace them in the field.

SAFETY PRECAUTIONS

Four types of messages are used in this manual to bring important information to your attention. Each of these messages will be italicized and identified as shown below.

DANGER: *"Danger" indicates the existence of a hazard that could result in death or serious bodily injury if the safety instruction is not observed.*

WARNING: *"Warning" indicates the existence of a hazard that could result in bodily injury if the safety instruction is not observed.*

CAUTION: *"Caution" indicates the existence of a hazard that could result in property damage if the safety instruction is not observed.*

NOTE: *"Note" contains general information that relates to your safe maintenance service.*

Improper repair of the computer may result in safety hazards. Toshiba requires service technicians and authorized dealers or service providers to ensure the following safety precautions are adhered to strictly.

Be sure to fasten screws securely with the right screwdriver. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.

If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

Chapter 1	Hardware Overview describes the Satellite Series system unit and each FRU.
Chapter 2	Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
Chapter 3	Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
Chapter 4	Replacement Procedures describes the removal and replacement of the FRUs.
Appendices	The appendices describe the following:

Handling the LCD module
Board layout
Pin assignments
Keyboard scan/character codes
Key layout
Screw torque list
Reliability

Conventions

This manual uses the following formats to describe, identify, and highlight terms and operating procedures.

Acronyms

On the first appearance and whenever necessary for clarification, acronyms are enclosed in parentheses following their definition. For example:

Read Only Memory (ROM)

Keys

Keys are used in the text to describe many operations. The key top symbol as it appears on the keyboard is printed in **boldface** type.

Key operation

Some operations require you to simultaneously use two or more keys. We identify such operations by the key top symbols separated by a plus (+) sign. For example, **Ctrl + Pause (Break)** means you must hold down **Ctrl** and at the same time press **Pause (Break)**. If three keys are used, hold down the first two and at the same time press the third.

User input

Text that you are instructed to type in is shown in the boldface type below:

DISKCOPY A: B:

The display

Text generated by the computer that appears on its display is presented in the typeface below:

```
Format complete
System transferred
```

Table of Contents

Chapter 1 Hardware Overview

Chapter 2 Troubleshooting Procedures

Chapter 3 Tests and Diagnostics

Chapter 4 Replacement Procedures

Figures

Appendices

Chapter 1

Hardware Overview

Chapter 1 Contents

Figures

Tables

1.1 Features

The Toshiba NB200 is a small-size PC notebook equipped with an Intel® Atom™ Processor, providing high-speed processing capabilities and advanced features. The computer employs a lithium ion battery that allows it to be battery-operated for long periods of time. The display uses 10.1-inch WSVGA LCD panel. Many features can be Built To Order (BTO) to customize the system for each user.

The computer has the following features:

- ❑ Processor

  The computer is equipped with an Intel® Pineview™ Processor.

- ❑ Memory (BTO)

  The computer has one SODIMM slot which comes standard with 1GB/2GB, accepting BTO for your memory requirements. It can incorporate up to 1 GB (XP) or 2 GB (Vista/Linux) of main memory. It supports DDR3 at 667MHz.

- ❑ Battery Pack (BTO)

  The computer is powered by one rechargeable and removable lithium ion battery pack. The capacity can be either 3-cell or 6-cell, depending on the model of the computer.

- ❑ RTC Battery

  The internal RTC battery backs up the Real Time Clock and calendar.

- ❑ Hard Disk Drive (HDD)

  The computer accommodates a 9.5 mm HDD with the following storage capacities:

  - 160/250GB, S-ATA (5,400rpm)
  - Additional HDD sizes may be introduced.

- ❑ Display

  The LCD display comes with the following:

  - 10.1" CSV- LCD, 1024 x 600 Resolution

- Graphics

  The computer uses Intel® NM10 Express Chipset for integrated graphics display.

- Keyboard

  The computer is equipped with a tile or flat keyboard. It comes with 85 or 86 keys supported and with optional Windows and application keys (except for Linux models).

- Pointing Device

  The integrated Touch Pad and two control buttons in the palm rest allow control of the on-screen pointer and support functions such as the scrolling of windows.

- External Monitor Port

  The analog VGA port provides support for VESA DDC2B compatible functions. A WDDM driver is ready for Vista.

- Universal Serial Bus (USB) Ports

  The computer has three USB 2.0 ports. It is supported to daisy-chain a maximum of 127 USB devices. The serial data transfer rate is 480 Mbps or 12 Mbps and 1.5 Mbps. These ports support PnP installation and hot plugging.

- Bridge Media Slot

  This slot allows you to insert SD/SDHC, MiniSD/ MicroSD (through adapter) and MMC memory cards. This model does not support CF cards, SmartMedia cards and Memory Sticks.

- Sound system

  The integrated sound system is composed of one 1.0W Zylux / FG internal speaker, an internal microphone and standard MIC-IN ports.

- Internal Camera

  A VGA webcam supports 0.3M pixels and comes with an LED indicator. The camera is not a rotation type.

- Internal Microphone

  The computer has a built-in internal microphone equipped with echo-cancellation.

- Headphones/Line-out Jack

  This jack connects speakers or stereo headphones. When connected to speakers or headphones, the internal speaker is automatically disabled.

- Microphone/Line-in Jack

  A 3.5mm mini microphone jack enables connection of a three-conductor microphone for monaural input and also enables the connection of a stereo device for audio input.

- LAN

  The computer has built-in support for 10M/100M Ethernet LAN (10/100 megabits per second, 10/100BASE-T). It employs a Realtek 8105E for 10M/100Mbit LAN.

- Wireless LAN (BTO)

  Some computers in this series are equipped with a Wireless LAN (WLAN) card. This WLAN module may come with the following types (depending on the model):

  - Atheros 802.11 bg (HB95 1x1)

❑ Figure 1-1A shows the computer and its system unit configuration.

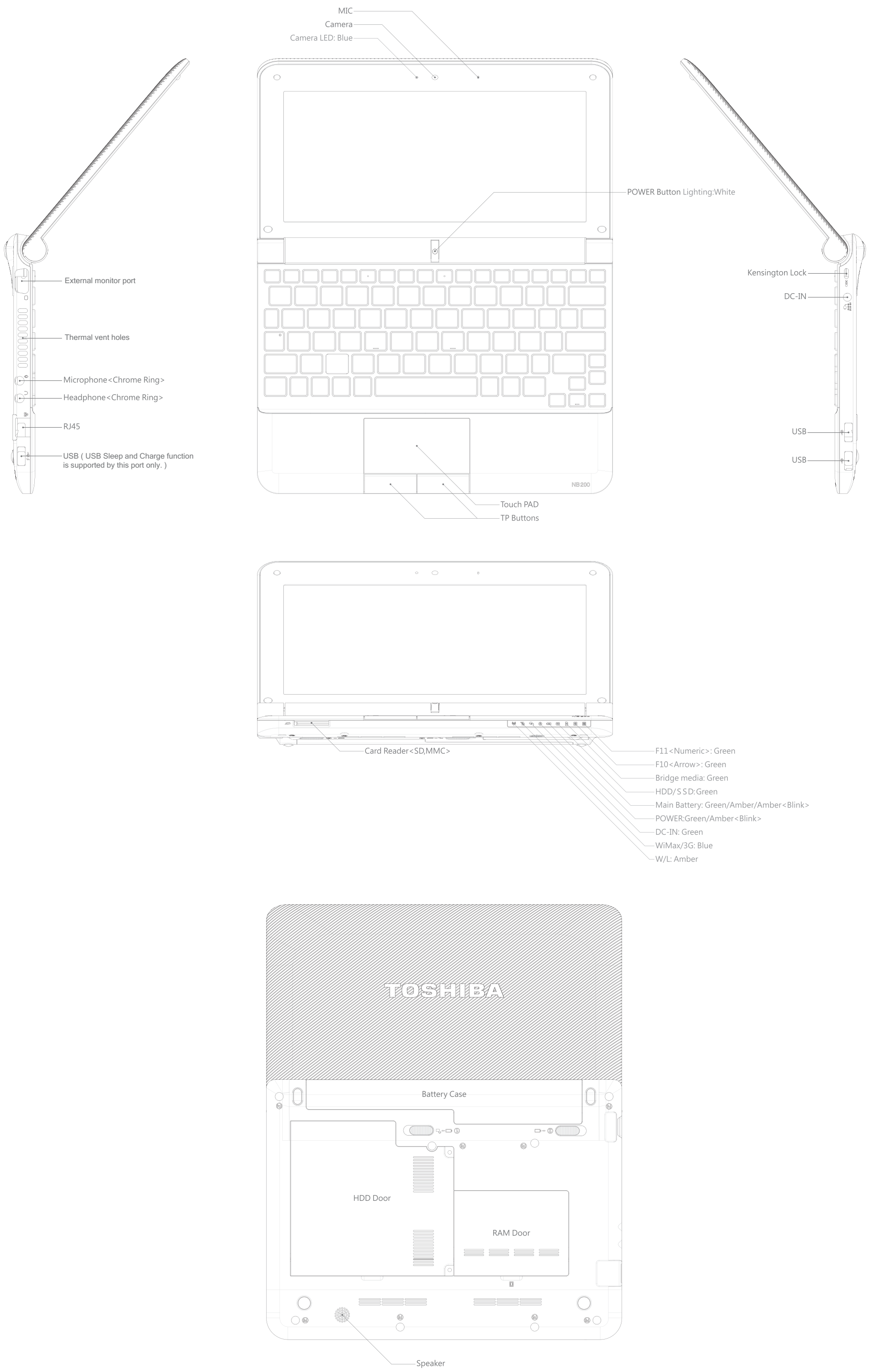
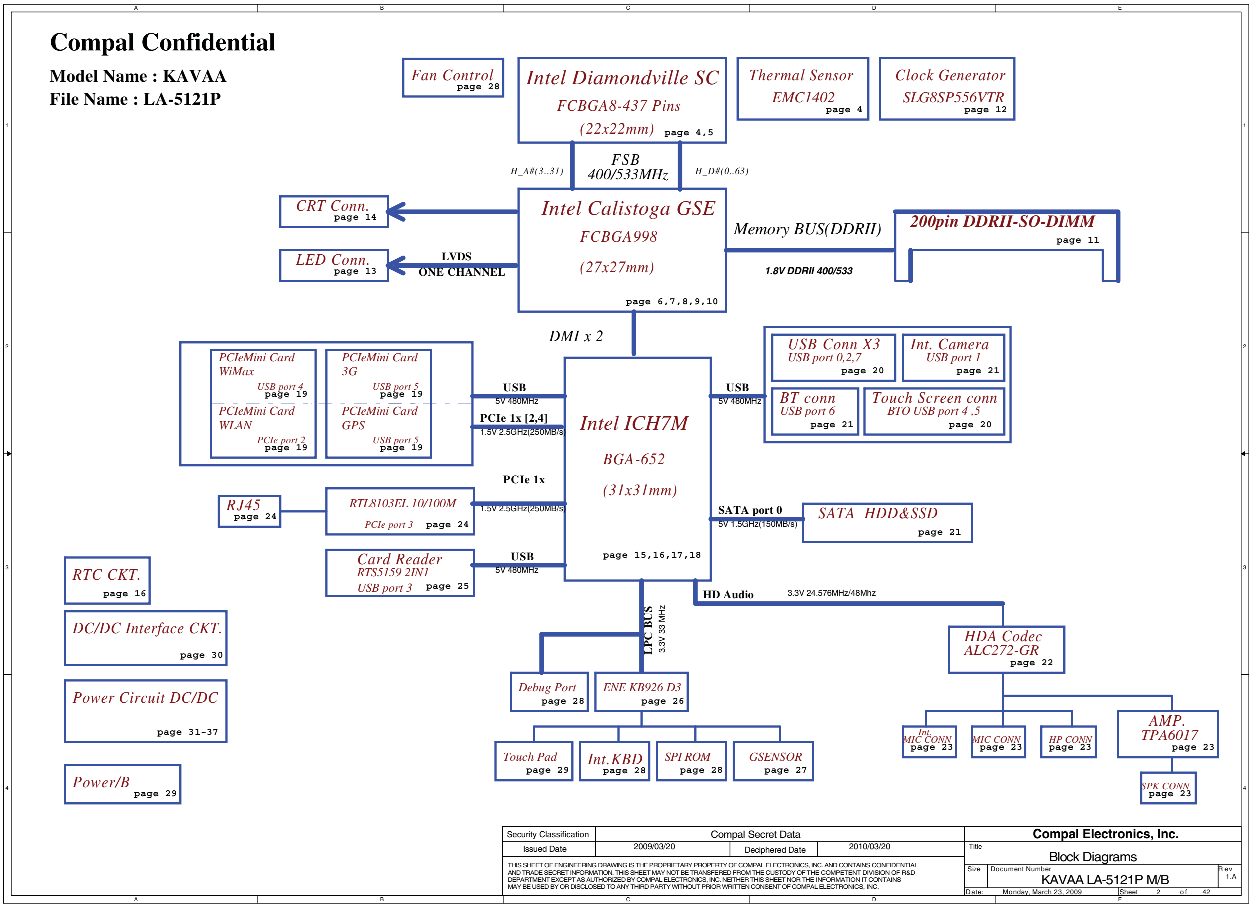


Figure 1-1A ID Parts Description Placement Part A


Compal Confidential
Model Name : KAVAA
File Name : LA-5121P
Fan Control page 28
Intel Diamondville SC
FCBGA8-437 Pins
(22x22mm) page 4,5
Thermal Sensor
EMC1402 page 4
Clock Generator
SLG8SP556VTR page 12
H_A#(3..31)
FSB
400/533MHz
H_D#(0..63)
CRT Conn. page 14
LED Conn. page 13
LVDS
ONE CHANNEL
Intel Calistoga GSE
FCBGA998
(27x27mm)
page 6,7,8,9,10
Memory BUS(DDRII)
1.8V DDRII 400/533
200pin DDRII-SO-DIMM page 11
DMI x 2
PCIeMini Card WiMax USB port 4 page 19
PCIeMini Card 3G USB port 5 page 19
PCIeMini Card WLAN PCIe port 2 page 19
PCIeMini Card GPS USB port 5 page 19
USB 5V 480MHz
PCIe 1x [2,4] 1.5V 2.5GHz(250MB/s)
Intel ICH7M
BGA-652
(31x31mm)
page 15,16,17,18
USB 5V 480MHz
USB Conn X3 USB port 0,2,7 page 20
Int. Camera USB port 1 page 21
BT conn USB port 6 page 21
Touch Screen conn BTO USB port 4 ,5 page 20
PCIe 1x
RJ45 page 24
RTL8103EL 10/100M PCIe port 3 page 24
1.5V 2.5GHz(250MB/s)
SATA port 0 5V 1.5GHz(150MB/s)
SATA HDD&SSD page 21
RTC CKT. page 16
Card Reader RTS5159 2IN1 USB port 3 page 25
USB 5V 480MHz
HD Audio 3.3V 24.576MHz/48Mhz
DC/DC Interface CKT. page 30
LPC BUS 3.3V 33 MHz
HDA Codec ALC272-GR page 22
Power Circuit DC/DC page 31-37
Debug Port page 28
ENE KB926 D3 page 26
Int. MIC CONN page 23
MIC CONN page 23
HP CONN page 23
AMP. TPA6017 page 23
Touch Pad page 29
Int.KBD page 28
SPI ROM page 28
GSENSOR page 27
Power/B page 29
SPK CONN page 23
Security Classification Compal Secret Data
Issued Date 2009/03/20 Deciphered Date 2010/03/20
Compal Electronics, Inc.
Title Block Diagrams
Size Document Number KAVAA LA-5121P M/B Rev 1.A
Date: Monday, March 23, 2009 Sheet 2 of 42

The system unit of the computer consists of the following components:

- Processor

  The computer is equipped with the following Intel® processor:

  - Intel® Pineview™ Processor.

- Memory (BTO)

  The computer has one SODIMM slot which comes standard with 1GB/2GB, accepting BTO for your memory requirements. It can incorporate up to 1 GB (XP) or 2 GB (Vista/Linux) of main memory. It supports DDR3 at 667MHz.

- BIOS ROM (EEPROM)

  The system BIOS and Keyboard BIOS share one single 1024KB flash ROM. The flash utility can be used to program both system and keyboard BIOS at the same time.

- System Controllers

  - ACPI2.0b and Windows Logo Program 3.0 compliant
  - Support SMBus specification V2.0
  - Hot keys for system control
  - Audio volume output control
  - Battery scope report and control
  - Power switch control
  - Internal Keyboard country selection

- Graphics Controller

  - Intel® NM10 Express Chipset for integrated graphics display.
  - TVAP and Smart External Monitor Support

- ❑ Audio Controller
  - Realtek Azalia ALC272
  - One Audio-in port: Mic-in/Line-in
  - One Audio-out port: Headphone-out/Line-out
  - Internal Microphone (MIC with echo cancellation)
  - Volume control: Digital control, Hot keys (Fn+3, Fn+4)
  - Microsoft inbox audio driver support

- ❑ Wireless LAN Controller
  - Atheros 802.11 bg (HB95 1x1)
  - WPS supported

1.2 2.5-inch HDD

The computer contains a low-profile and light-weight, high-performance HDD. The HDD interface conforms to Serial ATA. Storage capacities supported are 120 and 160 GB.

The HDD is shown in Figure 1-2 and some of its specifications are listed in Table 1-1.

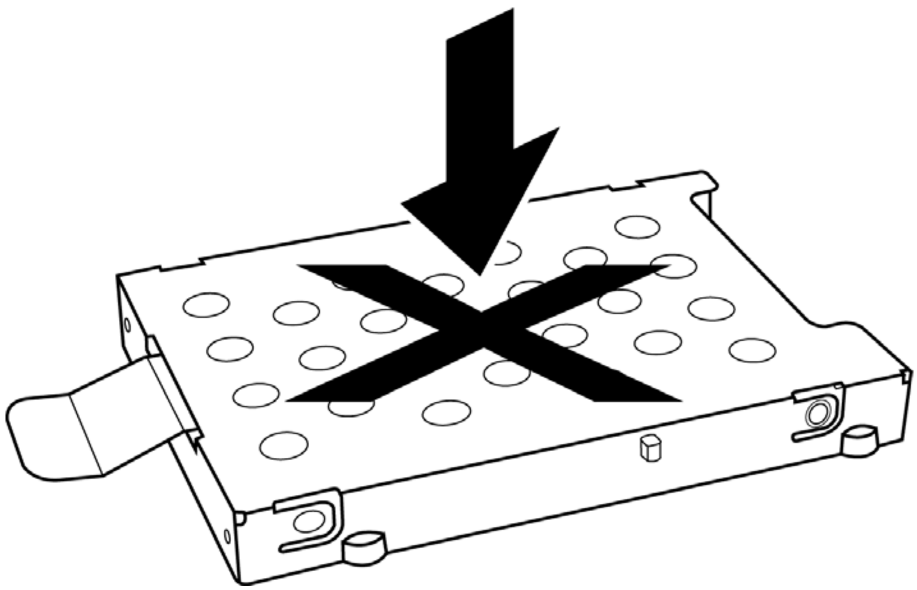


Figure 1-2 S-ATA HDD

Table 1-1 HDD Specifications

Item	Specifications	
Capacity (GB)	160 GB	250G
Rotational Speed (RPM)	5400 RPM	5400
Height	9.5mm, 2.5”	9.5mm, 2.5”
User Data Sectors	312,581,808	488,397,168
Bytes / Sector	512	512

1.3 Power Supply

The power supply unit provides constant voltage (19V) for the system board and performs the following functions:

1. Power input monitor
   - Checks whether the AC adapter (DC power supply) is connected to the computer.
   - Checks whether the battery pack is connected to the computer.
   - Monitors the DC power supply input voltage (AC Adapter output voltage).
2. Power supply's internal control
   - Turns on and off the battery pack charging power supply.
   - Issues a charging current instruction to the PWM control IC of the battery pack charging power supply.
   - Controls the supply of DC power supply input (AC Adapter output) to the power supply unit.
   - Controls the supply of power to the system block (load/logic circuit side).
   - Controls forced shutdown if the power supply malfunctions.
3. Logic circuit control
   - Instructs the gate array to enable/disable tuning the power on.
   - Controls power-on/off operation.
4. Status display
   - Turns on the Power LED (in Green).
   - Battery indicator (in Green or Amber).
   - DC-IN indicator (in Green)
5. External interface
   - Performs communication through the I2C bus (via the internal EC/KBC).
   - Transfers the power supply operation mode.

6. Output monitor

   - Monitors the voltage output to the system block (load/logic circuit side).
   - Monitors the voltage, over voltage, input/output current of the battery pack.
   - Monitors the internal temperature of the battery pack.
   - Monitors the supply voltage from the AC adapter.

1.4 Batteries

The computer has the following two types of batteries:

- ❑ Main Battery Pack
- ❑ Real Time Clock (RTC) Battery

1.4.1 Main Battery

The main battery pack serves as the computer's main power source when the AC adapter is not attached. The main battery maintains the state of the computer when the AC adapter is detached.

1.4.2 Battery Charging Control

Battery charging is controlled by EC KB926. When the AC adapter and battery pack are attached to the computer, the EC KB926 controls the charge on/off state and detects a full charge.

- ❑ Battery Charge

  When the AC adapter is attached, the battery is charged by off-state charge when the system is powered off or by on-state charge when it is powered on.

Table 1-2 Quick/Normal Charging Time

State	Charge Time	
Off-State Charge	3 Cell	About 4 hours
	6 Cell	About 6 hours
On-State Charge	3/6 Cell	About 12 hours

> ***NOTE:*** *The time required for normal charge depends on the power consumption by the system. Using a fluorescent lamp and frequently accessing the disk consumes more power and lengthens the charge time.*

Any of the following can stops battery charge:

1. The battery becomes fully charged.
2. The AC adapter or battery pack is removed.
3. The battery or AC adapter voltage is abnormal.

- ❑ Detection of full charge

A full charge is detected only when the battery is being charged by quick or normal charge. A full charge is detected when either of the following conditions is met:

1. The current in the battery charging circuit drops below the predetermined value.
2. The charging time exceeds the fixed limit.

1.4.3 RTC Battery

The RTC battery provides power to keep the current date, time and other system information in memory while the computer is turned off.

Chapter 2

Troubleshooting Procedures

Chapter 2 Contents

Figures

Tables

2.1 Troubleshooting Introduction

Chapter 2 describes how to determine if a Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. The FRUs covered are:

1. Display	7. Wireless LAN	13. External ODD
2. HDD/SSD	8. Camera	14. Bridge media
3. Keyboard	9. Bluetooth(10BL no support)	15. 3D sensor(10BL no support)
4. USB ports	10. Headphone	16. Sleep charge(10BL no support)
5. Touchpad	11.MIC	
6. Speaker	12. 3G module(10BL no support)	

The Diagnostics Disk operations are described in Chapter 3. Detailed replacement procedures are given in Chapter 4.

The following tools are necessary for implementing the troubleshooting procedures:

1. Phillips screwdriver (2 mm)
2. 6mm nut driver (for the helix screw nuts on the rear ports for RAM door)
3. 2DD or 2HD formatted work disk for floppy disk drive testing
4. Torx screw driver with type T6 bit for HDD door
5. USB memory disk
6. Multimeter
7. External monitor\ODD
8. USB compatible keyboard
9. Multimedia sound system with line-in and line-out ports
10. Headphones
11. USB test module and USB cable
12. MIC line

2.2 Troubleshooting Flowchart

If you know the location of the malfunction, turn directly to the appropriate section of this chapter. If the problem is unspecified, use the flowchart in Figure 2-1 as a guide for determining which troubleshooting procedures to execute. Before performing any troubleshooting procedures, verify the following:

- Ask the user if a password is registered, if it is, ask him or her to enter the password.
- Verify with the customer that Toshiba Windows XP/Vista/Linux is installed on the hard disk. Operating systems that were not preinstalled by Toshiba can cause the computer to malfunction.

- Make sure all optional equipment is removed from the computer.

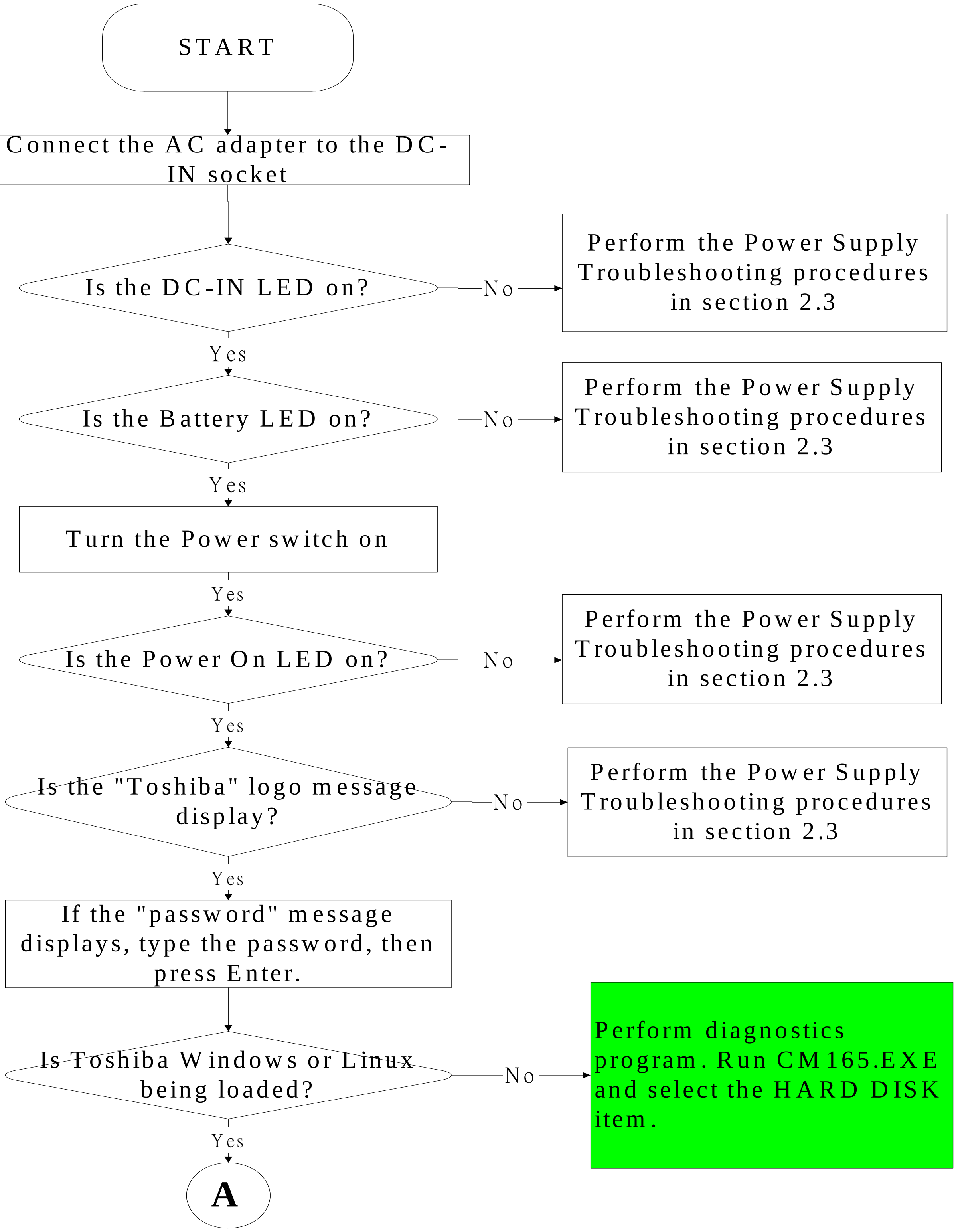


Figure 2-1 Troubleshooting flowchart (1/2)

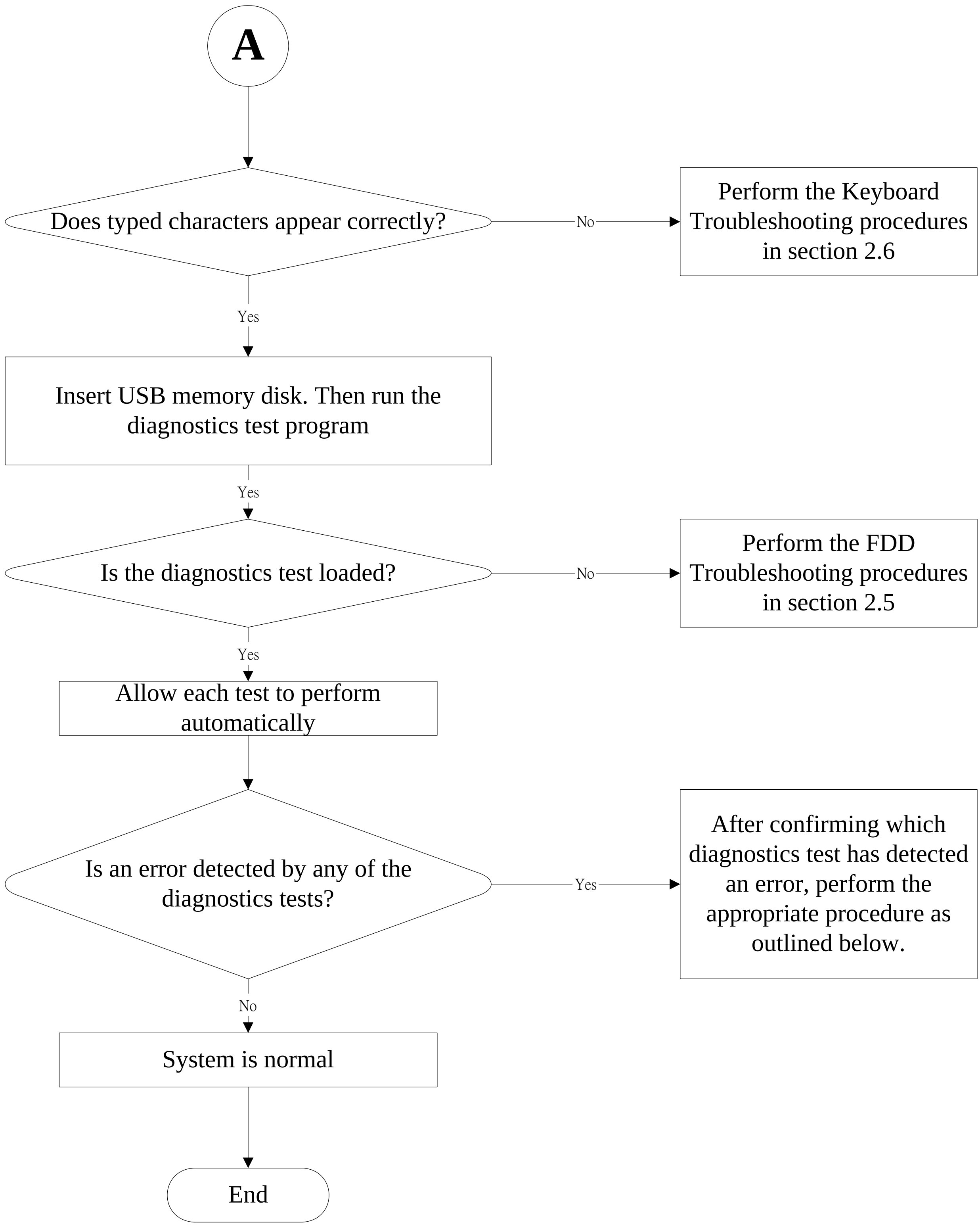


Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The test program should be executed several times to isolate the problem. When a problem has been located, perform the appropriate troubleshooting procedures as follows:

1. If an error is detected by the battery test, perform the Power Supply Troubleshooting procedures in Section 2.3

2. If an error is detected by the display test, perform the Display Troubleshooting procedures in Section 2.4

3. If an error is detected by the keyboard test, perform the Keyboard Troubleshooting procedures in Section 2.5

4. If an error is detected by the TouchPad test, perform the TouchPad Troubleshooting procedures in Section 2.7

5. If an error is detected by the audio test, perform the Speaker Troubleshooting procedures in Section 2.8 and the Optical Drive Troubleshooting Procedures in Section 2.9

Other problems that are not covered by the diagnostics program may be discovered by a user.

1. If an error is detected when using an external USB device, perform the External USB Devices Troubleshooting procedures in Section 2.6
2. If an error is detected when using the speakers, perform the Speaker Troubleshooting procedures in Section 2.8
3. If an error is detected when using the Wireless LAN, perform the Wireless LAN Troubleshooting procedures in Section 2.10
4. If an error is detected when using the Bluetooth, perform the Bluetooth Troubleshooting procedures in Section 2.12
5. If an error is detected when using the MIC, perform the MIC troubleshooting procedures in Section 2.16

2.3 Power Supply Troubleshooting

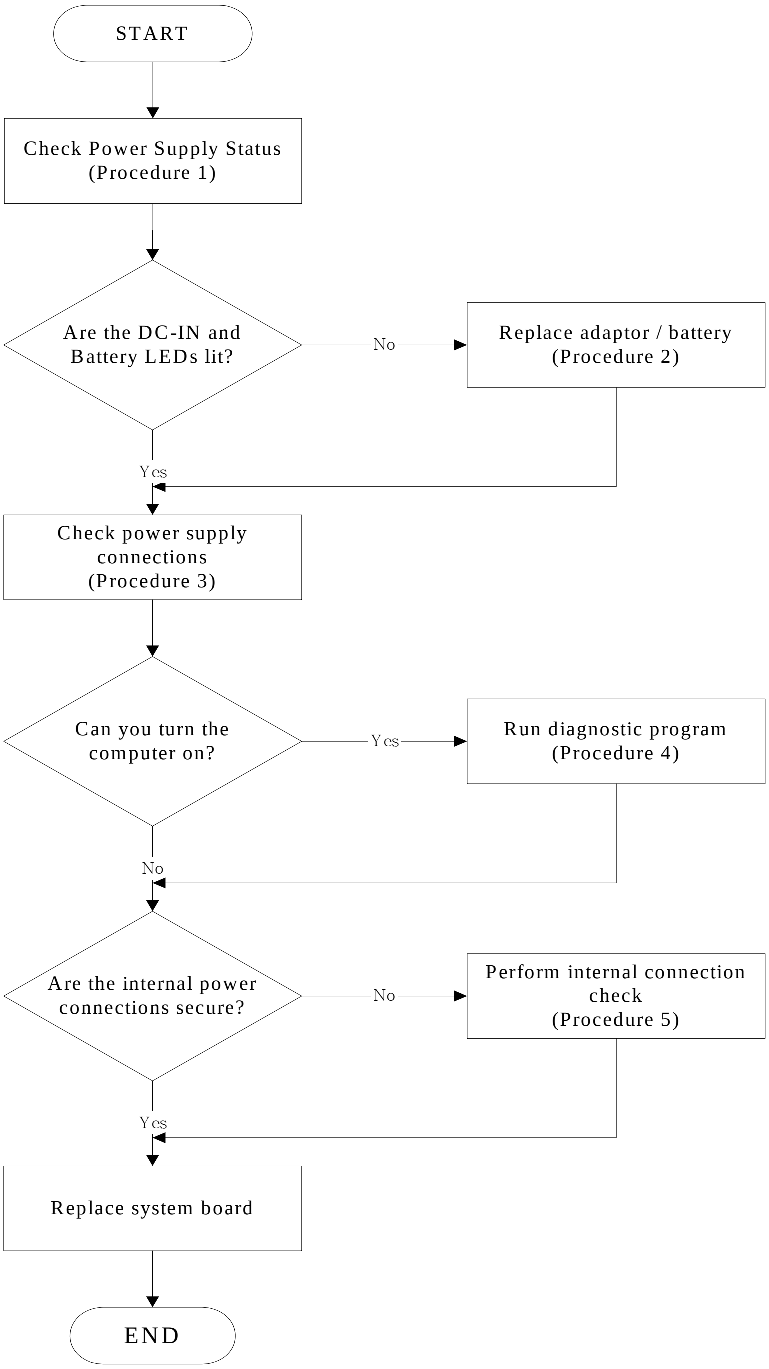


Figure 2-2 Power Supply Troubleshooting Process

The power supply controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures

as instructed. The flowchart in Figure 2-2 gives a summary of the process. The procedures described in this section are:

Procedure 1: Power status check

Procedure 2: Adaptor / battery replacement

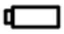
Procedure 3: Power supply connection check

Procedure 4: Diagnostic check

Procedure 5: Internal connection check

Procedure 1 Power Status Check

The following LEDS indicate the power supply status:

 Battery LED

 DC-IN LED

The power supply controller displays the power supply status through the Battery and the DC-IN LEDS as listed in the tables below.

Table 2-1 Battery LED

Battery LED	status
Lights Amber	Battery has been charging and AC adapter is connected.
Lights Green	Battery is fully charged and AC adapter is connected.
Flashes Amber	Battery charge is low. The AC adaptor must be connected to recharge the battery.
Doesn't light	Any condition other than those above.

Table 2-2 DC-IN LED

DC-IN LED	**Power supply status**
Solid on	AC power exists (LED is Green).
Off	No AC power exists.

To check the power supply status, install a battery pack and connect an AC adaptor to the DC-IN port on the computer and to a power supply.

If the DC-IN LED or Battery LED is not lit, go to Procedure 2.

Procedure 2 Adaptor / battery replacement

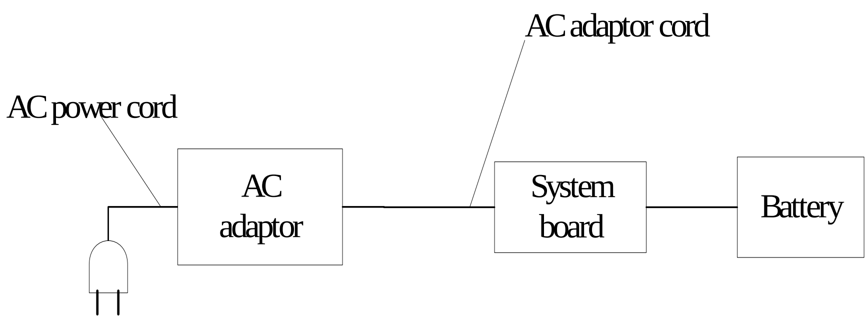
A faulty adaptor may not supply power or may not charge the battery. Perform Check 1.

Check 1 Connect a new AC adaptor. If the problem is not resolved, go to Check 2.

Check 2 Insert a new battery. If the problem is still not resolved, go to Procedure 3.

Procedure 3 Power supply connection check

The power supply wiring diagram is shown below:



Any of the connectors may be disconnected. Perform Check 1.

Check 1 Disconnect the AC power cord from wall outlet. Check the power cable for breaks. If the power cord is damaged, connect a new AC power cord. If there is no damage, go to Check 2.

Check 2 Make sure the AC adaptor cord and AC power cord are firmly plugged into the DC-IN socket, AC adaptor inlet and wall outlet. If these cables are connected correctly, go to Check 3.

Check 3 Make sure that the DC-IN input port socket is firmly secured to the system board of the computer.

- If the DC-IN input socket is loose, go to Procedure 5.
- If it is not loose, go to Check 4.

Check 4 Use a multi-meter to make sure that the AC adaptor output voltage is close to 19 V. If the output is several percent lower than 19 V, go to Check 5. If the output is close to 19 V, go to Check 6.

Check 5 Connect a new AC adaptor or AC power cord.

- If the DC-IN LED does not light, go to Procedure 4.
- If the battery LED does not light, go to Check 6.

Check 6 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery LED still does not light, go to Procedure 4.

Procedure 4 Diagnostic check

The power supply may not charge the battery pack. Perform the following procedures:

1. Reinstall the battery pack.
2. Attach the AC adaptor and turn on the power. If you cannot turn on the power, go to Procedure 5.
3. Run the Diagnostic test following the procedures described in Chapter 3, Tests and Diagnostics. If no problem is detected, the battery is functioning normally.

Procedure 5 Replacement check

The system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. Check the connection between the AC adaptor and the system board. After checking the connection, perform Check 1:

Check 1 Use a multi-meter to make sure that the fuses on the system board are not blown. If a fuse is not blown, go to Check 2. If a fuse is blown, go to Check 3.

Check 2 Make sure that the battery cable is firmly connected to the system board. If it is connected firmly, go to Check 3.

Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.4 Display Troubleshooting

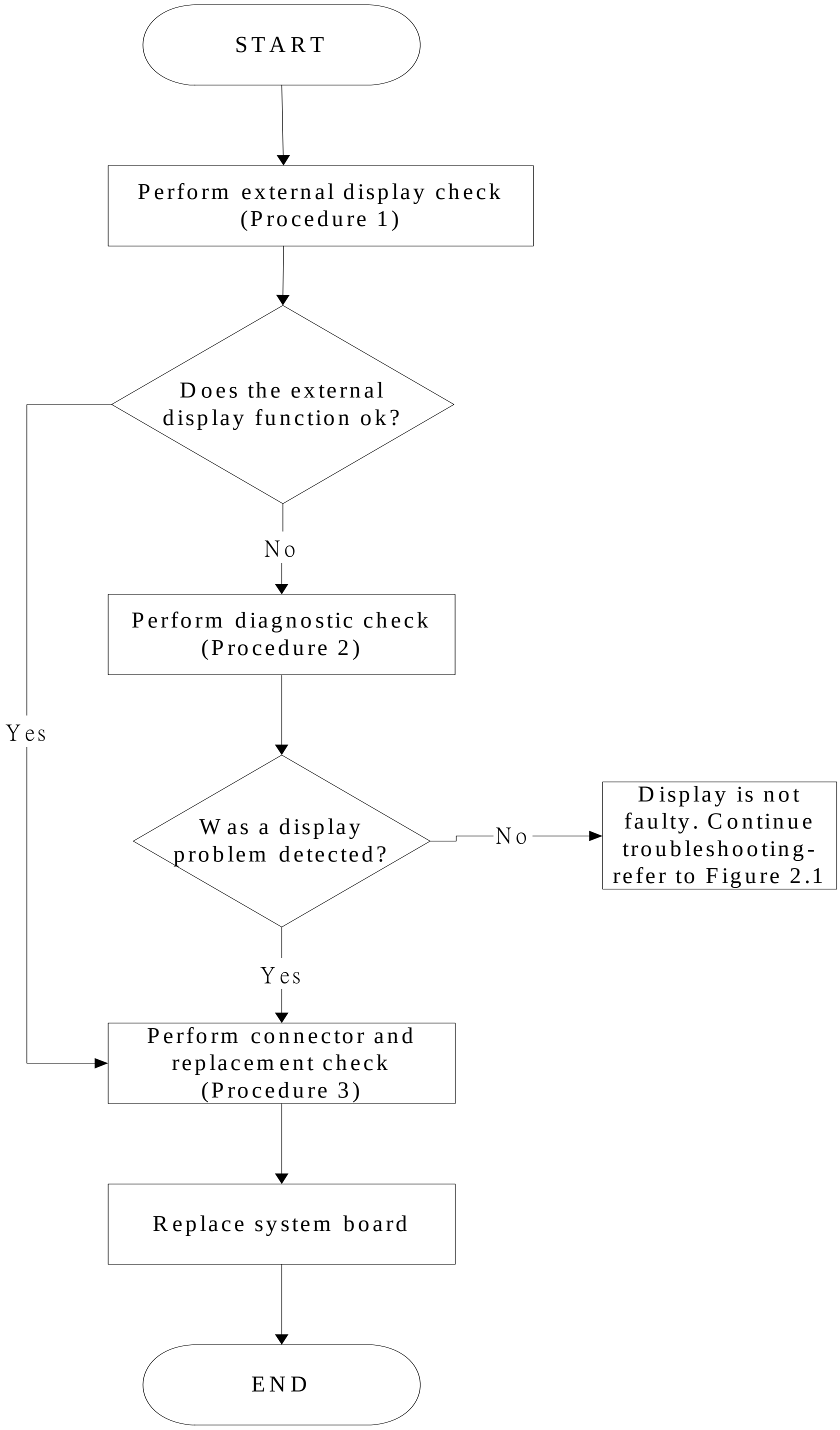


Figure 2-3 Display troubleshooting process

This section describes how to determine if the computer's display is functioning properly. The process is outlined in Figure 2-3. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: External display check

Procedure 2: Diagnostic check

Procedure 3: Connector and replacement check

Procedure 1 External display check

Connect an external display to the computer's external monitor port, and then boot the computer. The computer automatically detects the external display.

If the external display works correctly, the internal LCD may be damaged. Go to Procedure 3.

If the external monitor appears to have the same problem as the internal monitor, the system board may be damaged. Go to Procedure 2.

Procedure 2 Diagnostic check

The Display Test program is stored on the computer's Diagnostics disk. This program checks the display controller on the system board. Insert the Diagnostics disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details.

If an error is detected, go to Procedure 3. If an error is not detected, the display is functioning properly.

Procedure 3 Connector and replacement check

The LCD module and system board are connected to the display circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

Check 1 Make sure the DDR module is seated properly. Test display again. If the problem still exits, replace the DDR RAM module. If the problem still exists, perform Check 2.

Check 2 Replace the LCD module with a new one and test display again. If the problem still exists, perform Check 4.

Check 3 Replace the LCD cable with a new one and test display again. If the problem still exists, perform Check 5.

Check 4 The system board may be damaged. Replace it with a new one.

2.5 Keyboard Troubleshooting

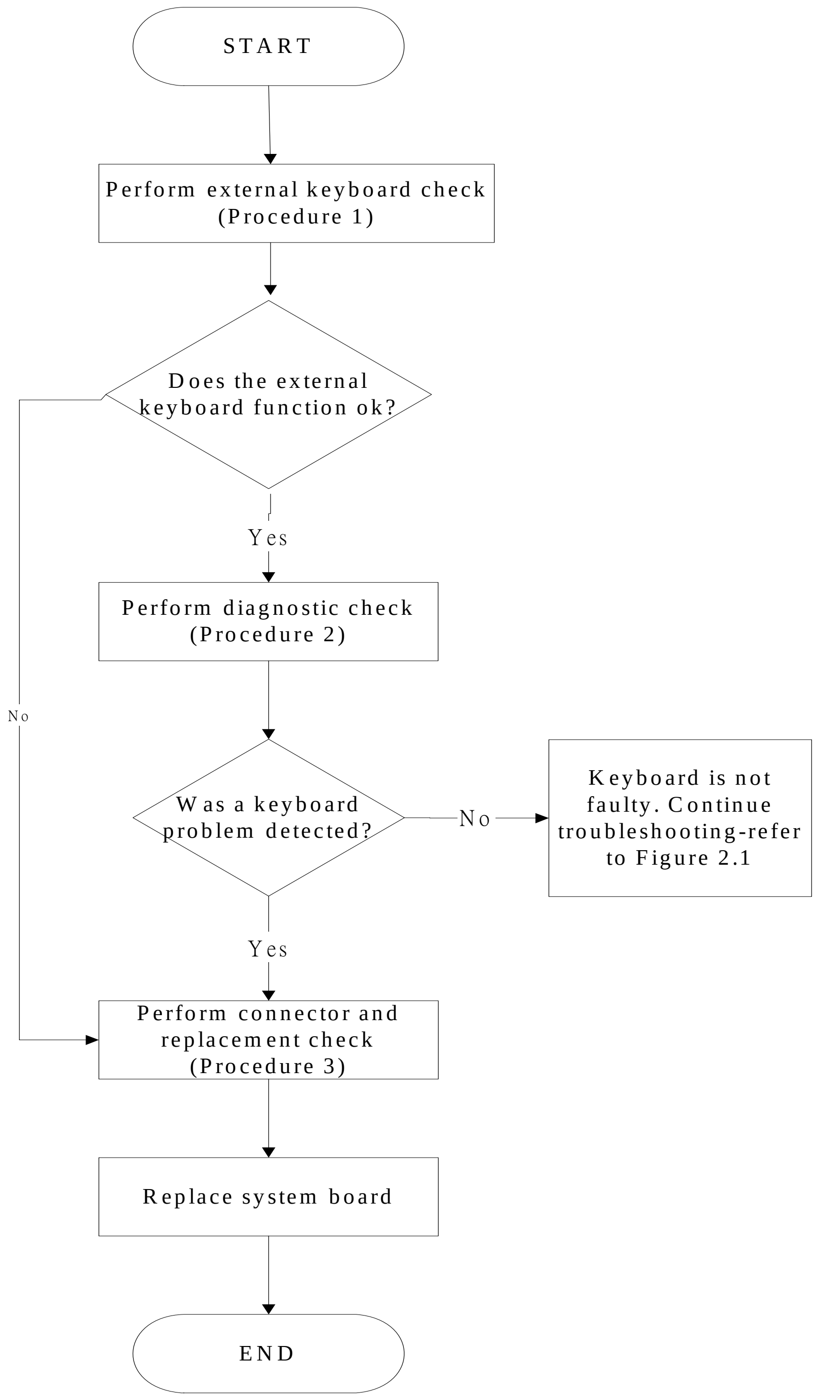


Figure 2-4 Keyboard troubleshooting process

To determine if the computer's keyboard is functioning properly, perform the following procedures. Figure 2-5 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: External keyboard check

Procedure 2: Diagnostic check

Procedure 3: Connector and replacement check

Procedure 1 External keyboard check

Connect a USB keyboard to one of the computer's USB ports, and then boot the computer. The computer automatically detects the external keyboard.

If the external keyboard works correctly, the internal keyboard or its connections may be faulty. Go to Procedure 2.

If the external keyboard appears to have the same problem as the internal keyboard, the system board may be having some problem. Replace it with a new one and following the instructions in Chapter 4.

Procedure 2 Diagnostic check

Run the test and Diagnostics Program, which will automatically execute the Keyboard Test. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to run the program.

If an error is located, go to Procedure 3. If an error does not occur, the keyboard is functioning ok.

Procedure 3 Connector and replacement check

The keyboard and/or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks.

Check 1 Make sure the keyboard cable is firmly connected to the system board.

If the connection is loose, reconnect firmly and repeat Procedure 2. If there is still an error, go to Check 2.

Check 2 The keyboard may be damaged. Replace it with a new one following the instructions in Chapter 4.

If the problem still exists, perform Check 3.

Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.5 External USB Devices Troubleshooting

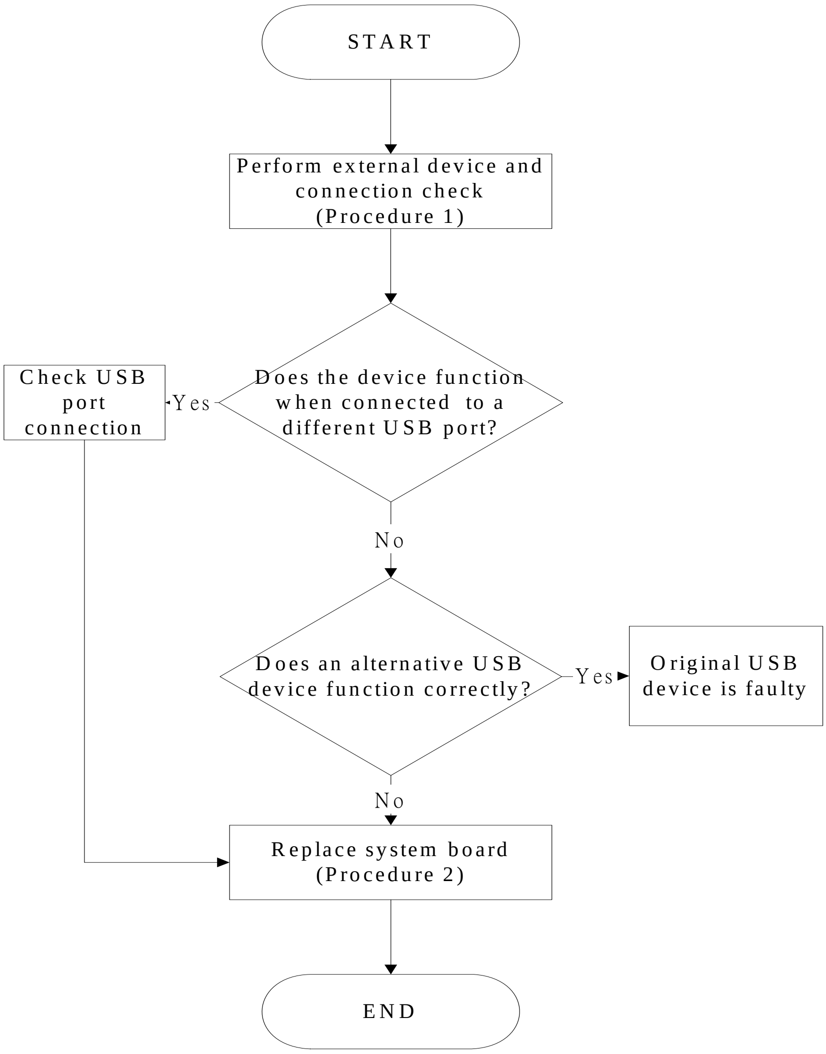


Figure 2-5 External USB device troubleshooting process

To determine if the computer's external USB devices are functioning properly, perform the following procedures. Figure 2-6 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1: External device and connection check

Procedure 2: Replace system board

Procedure 1 External device and connection check

The USB device may be damaged or the connection may be faulty. Perform Check 1.

Check 1 Make sure USB device cable is firmly plugged into one of the USB sockets. If the cable is connected correctly, go to Check 2.

Check 2 Plug the USB device into another USB socket (there are three in all). If the USB device still does not work, go to Check 4.

If the device functions correctly when connected to another USB port, go to Check 3.

Check 3 Make sure that the USB socket is firmly secured to the system board of the computer. If the malfunction remains, the system board or USB small board may be damaged. Go to Procedure 2.

Check 4 Connect an alternative USB device to one of the computer's USB ports, and then boot the computer. The computer automatically detects the external device.

If the alternative USB device works correctly, the original device may be damaged and should be replaced.

If the alternative USB device appears to have the same problem as the original device, the system board or USB small board may be damaged. Go to Procedure 2.

Procedure 2 Replace system board

If the error persists, the system board or USB small board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.6 TouchPad Troubleshooting

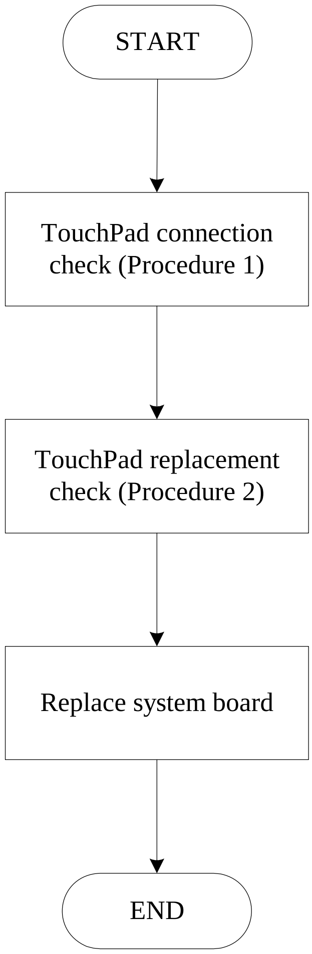


Figure 2-6 Touchpad troubleshooting process

To determine if the computer's built-in TouchPad is functioning properly, perform the following procedures. Figure 2-9 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1: TouchPad connection check

Procedure 2: TouchPad replacement check

Procedure 1 TouchPad connection check

The TouchPad is connected via the TouchPad FPC to the system board. Make sure the TouchPad FPC cable is firmly connected to the TouchPad and system board. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks.

If any of the connections are loose, reconnect firmly. If any of the connections is damaged, or there is still an error, go to Procedure 2.

Procedure 2 TouchPad replacement check

The TouchPad unit or FPC may be defective or damaged. Replace each with a new one following the steps in Chapter 4. If the FDD is still not functioning properly, replace the system board with a new one following the steps in Chapter 4.

2.7 Speaker Troubleshooting

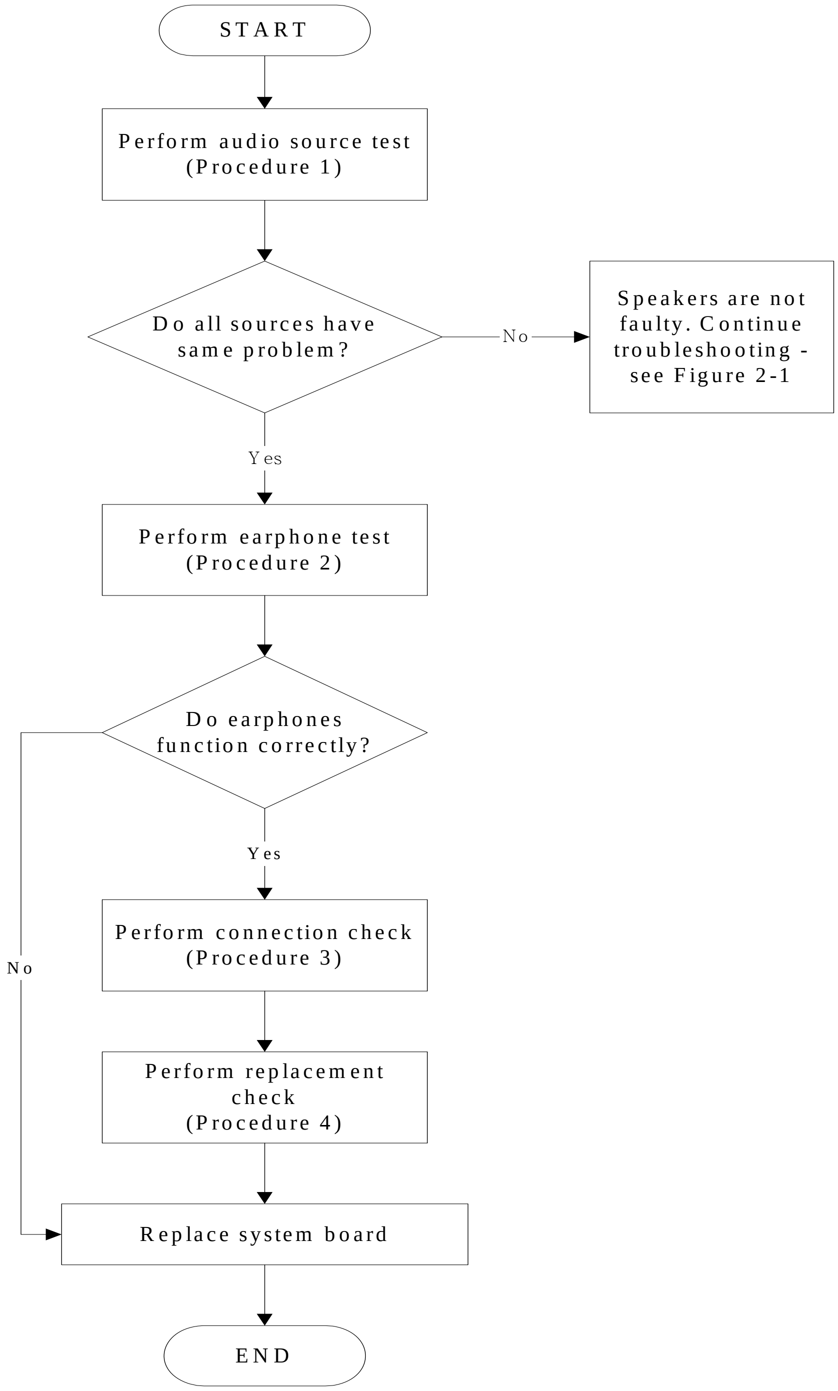


Figure 2-7 Speaker troubleshooting process

To determine if the computer's built-in speakers are functioning properly, perform the following procedures. Figure 2-10 outlines the process. First adjust the speaker volume to an appropriate level. Start with Procedure 1 and continue as instructed.

Procedure 1: Audio source test

Procedure 2: Earphone test

Procedure 3: Connection check

Procedure 4: Replacement check

Procedure 1 Audio source test

Try different audio sources (e.g. an audio CD and digital music file) to determine whether the fault is in the speaker system or not. If not all sources have sound problem, the problem is in the monaural devices. If all have the same problem, continue with Procedure 2.

Procedure 2 Earphone test

Connect a set if earphones or external speakers. If these function correctly, go to Procedure 3. If they do not function correctly, the system board may be defective or damaged. Replace it with a new one.

Procedure 3 Connection check

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and make sure the speaker cable is firmly connected to the audio board. If the speakers are still not functioning properly, go to Procedure 4.

Procedure 4 Replacement check

If the monaural speakers don't sound properly, the monaural speakers may be defective or damaged. Replace them with new ones. If the monaural speakers still do not work properly, try replacing in turn the audio board and system board.

2.6 Wireless LAN Troubleshooting

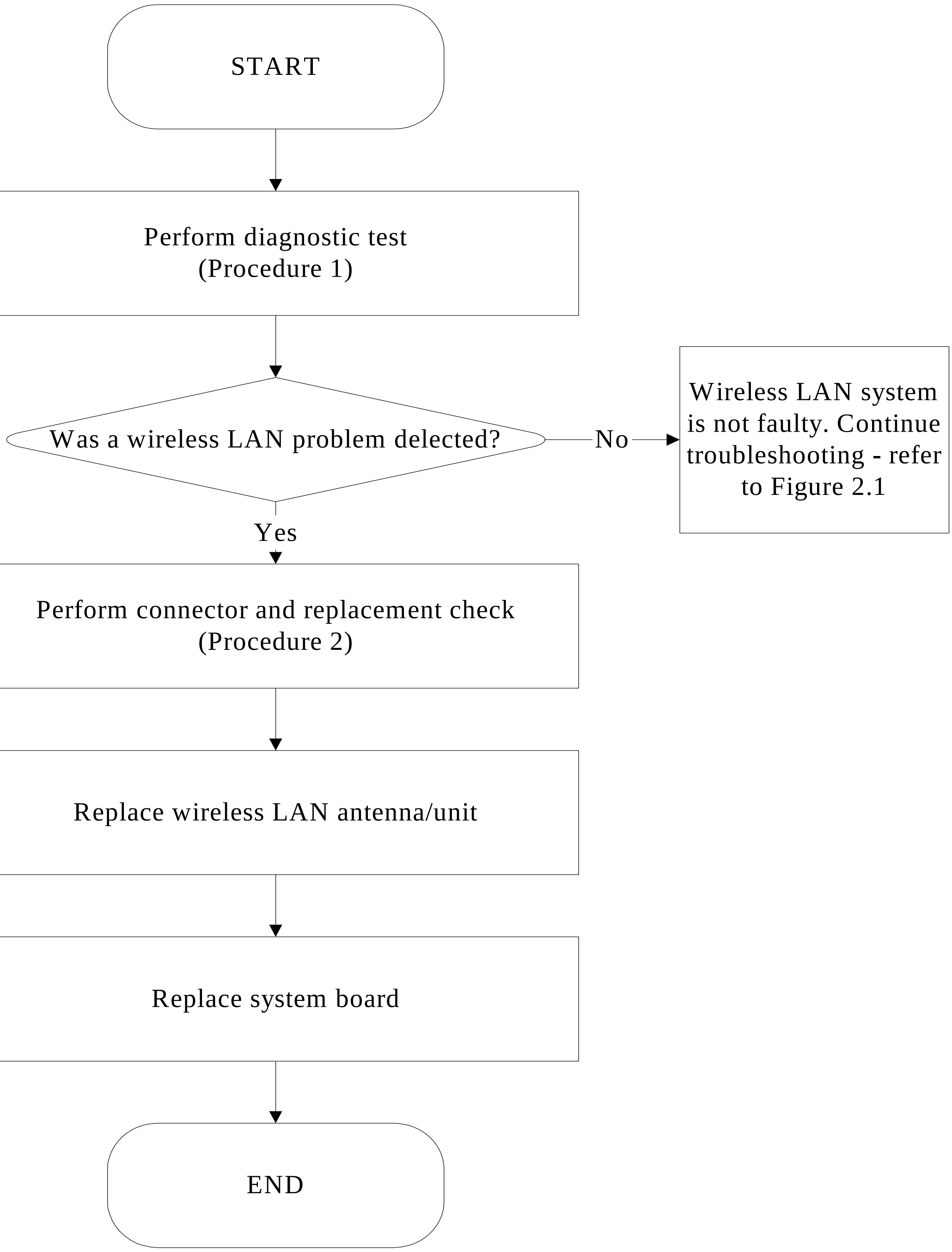


Figure 2-8 Wireless LAN troubleshooting process

The wireless LAN antenna wire, wireless LAN unit or system board may each be the source of a wireless LAN fault. Any of these components may be damaged. To determine if the

computer’s wireless LAN system is functioning properly, perform the following procedures.

Figure 2-15 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test

Procedure 2: Connector and replacement check

Procedure 1 Diagnostic test

Run the Diagnostic Program, which will automatically execute the wireless LAN test. Test and Diagnostic for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, the wireless LAN system is functioning properly.

Procedure 2 Connector and replacement check

The wireless LAN antenna, wireless LAN unit or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1 Make sure that the wireless LAN antenna is firmly connected to the Wireless LAN module (refer to Chapter 4 for instructions) and that the wireless LAN module is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2 Check that the wireless communication function is enable by BIOS setup and FN+F8 , and then make sure that the wireless communication LED on the front panel is light. If the LED is light but the wireless LAN function is still faulty, the antenna may be damaged. Replace with a new antenna following the steps in Chapter 4, *Replacement Procedures*. If the problem persists, or if the wireless LAN LED is not light when the wireless communication function is enabled by BIOS setup and FN+F8, go to Check 3.

Check 3 The wireless LAN unit may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 4.

Check 4 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.7 Camera Troubleshooting

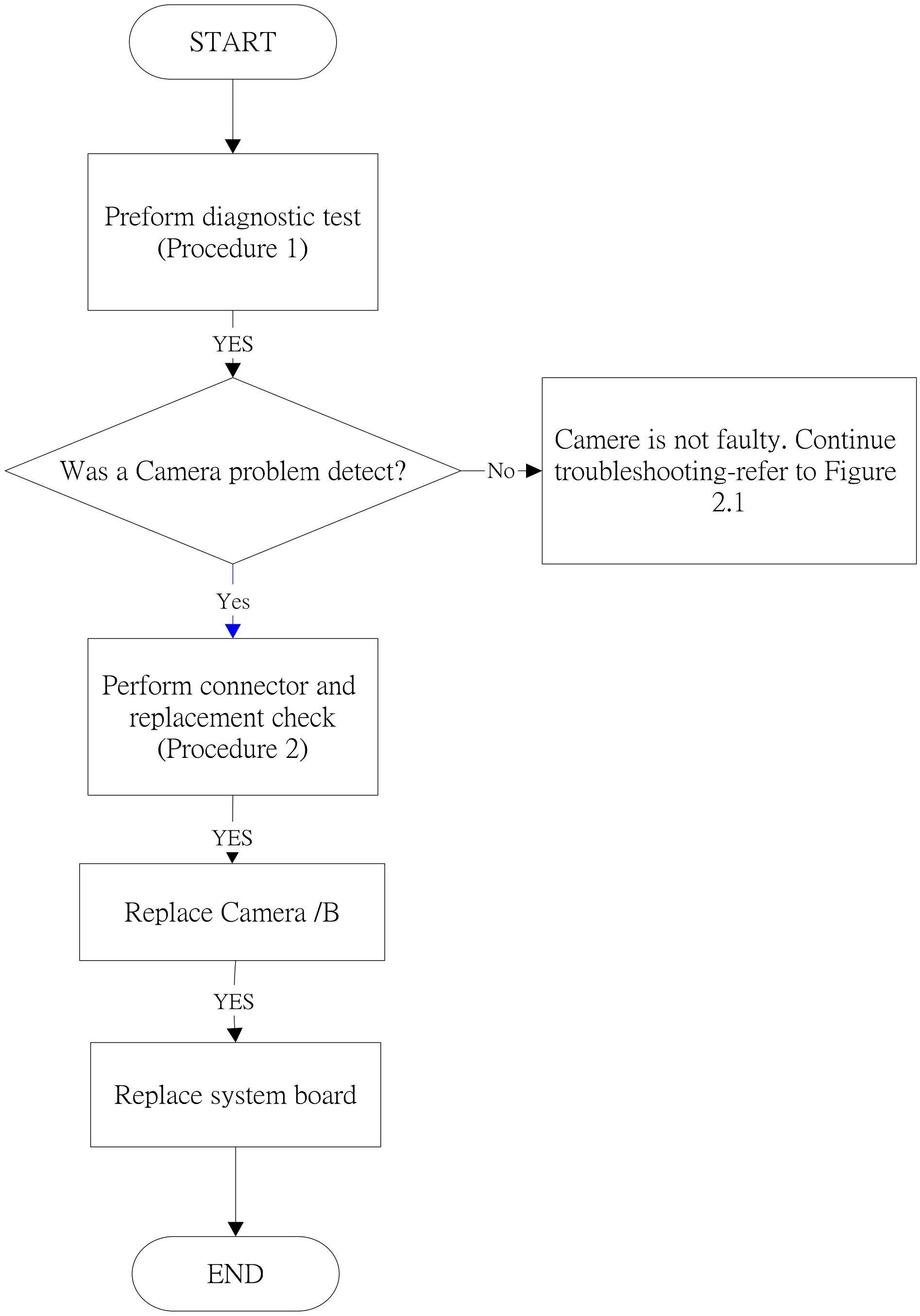


Figure 2-9 Camera troubleshooting process

The Camera board or system board may be the reason of a Camera fault. Either of these two components may be damaged. To determine if the computer's Camera is functioning properly, perform the following procedures. Figure 2-14 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test
Procedure 2: Connector and replacement check

Procedure 1 Diagnostic test

Run the functioning Program in windows, which will display the Camera test result.

If tests and diagnostics result abnormal go to Procedure 2. If an error is not located, the Camera system is functioning properly.

Procedure 2 Connector and replacement check

The Camera board or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1 Make sure that the Camera board cable is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2 The Camera board may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 3.

Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.8 Bluetooth Troubleshooting

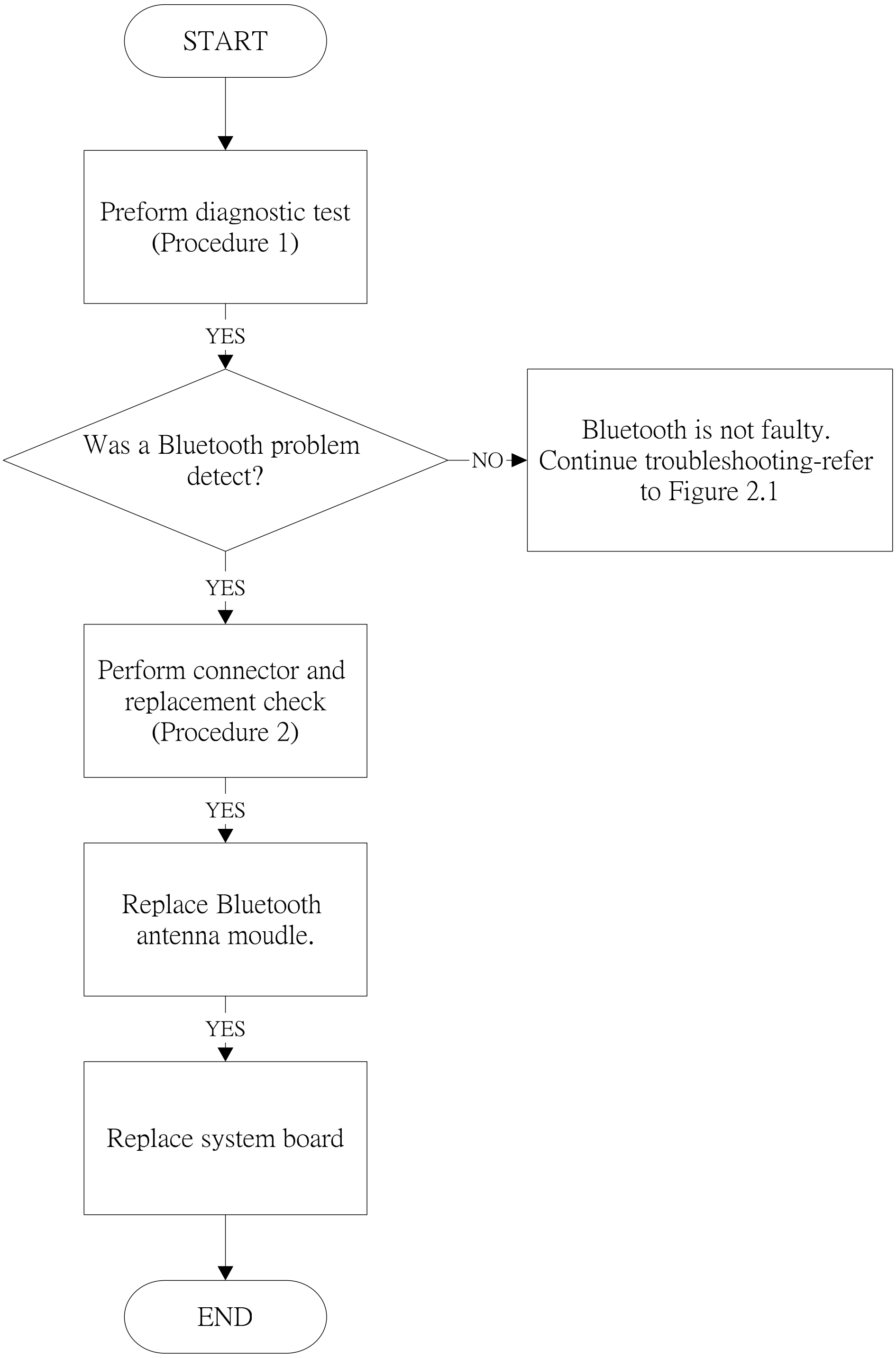


Figure 2-10 Bluetooth troubleshooting process

The Bluetooth antenna wire, Bluetooth module or system board may be the reason of a Bluetooth fault. Any of these components may be damaged. To determine if the computer's Bluetooth is functioning properly, perform the following procedures. Figure 2-16 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test
Procedure 2: Connector and replacement check

Procedure 1 Diagnostic test

Run the Diagnostic Program, which will automatically execute the Bluetooth test. Refer to Chapter 3, Tests and Diagnostics for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, the Bluetooth system is functioning properly.

Procedure 2 Connector and replacement check

The Bluetooth, antenna module or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1 Make sure the Bluetooth cable is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2 Check the wireless communication function is enabled by BIOS setup and FN+F8, then make sure that the communication LED on the left panel is lit. If the problem persists, or if the Bluetooth communication LED is not lit when the wireless communication function is enabled by BIOS setup and FN+F8 to "On", go to Check 3.

Check 3 The Bluetooth module may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 4.

Check 4 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.9 2in1 card Troubleshooting

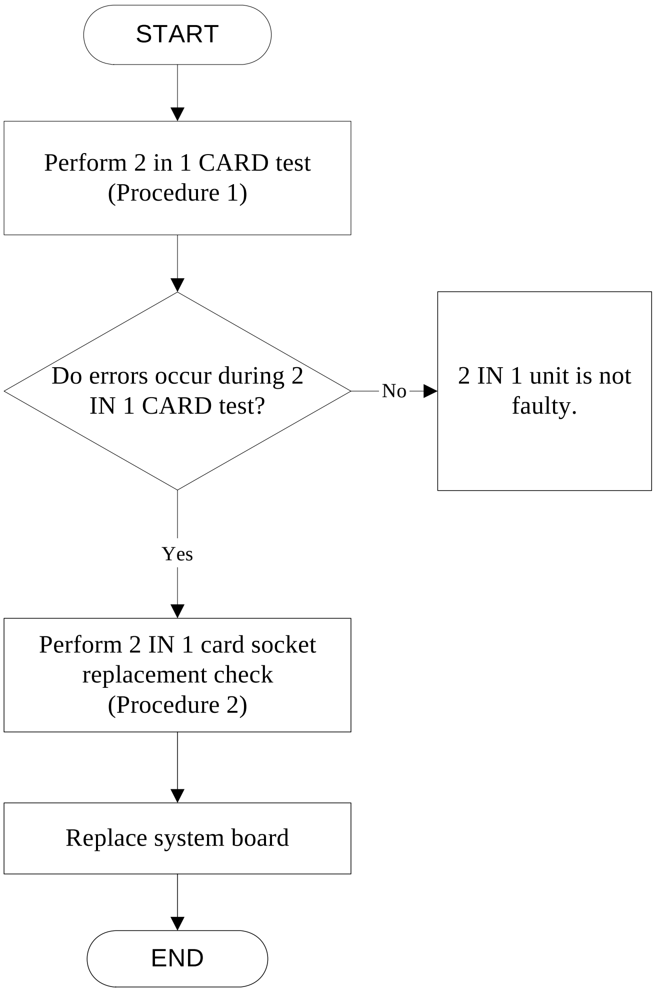


Figure 2-11 2in 1 card troubleshooting process

This section describes how to determine if the 2 IN 1 Card is functioning properly. The process is summarized in Figure 2-16. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: 2 in 1 card test

Procedure 2: 2 in 1 card socket check

Procedure 1 2 in 1card test

The 2 in 1 Card test card contains a 2 in 1 card test program. Ensure the card in fully inserted into the socket before running the program.

If an error occurs during the 2in 1 card test, perform Procedure 2. If no error occurs, it is likely that the original 2 in 1 card was faulty.

Procedure 2 2 in 1 Card socket check

The 2 in 1 Card socket may be damaged or defective, for instance the socket pins can be bent. Disassemble the computer following the steps described in Chapter 4, Replacement Procedures and check the socket. If the problem persists, the system board may be defective or damaged. Replace the system board with a new one following the steps in Chapter 4.

2.10 HDD/SSD Troubleshooting

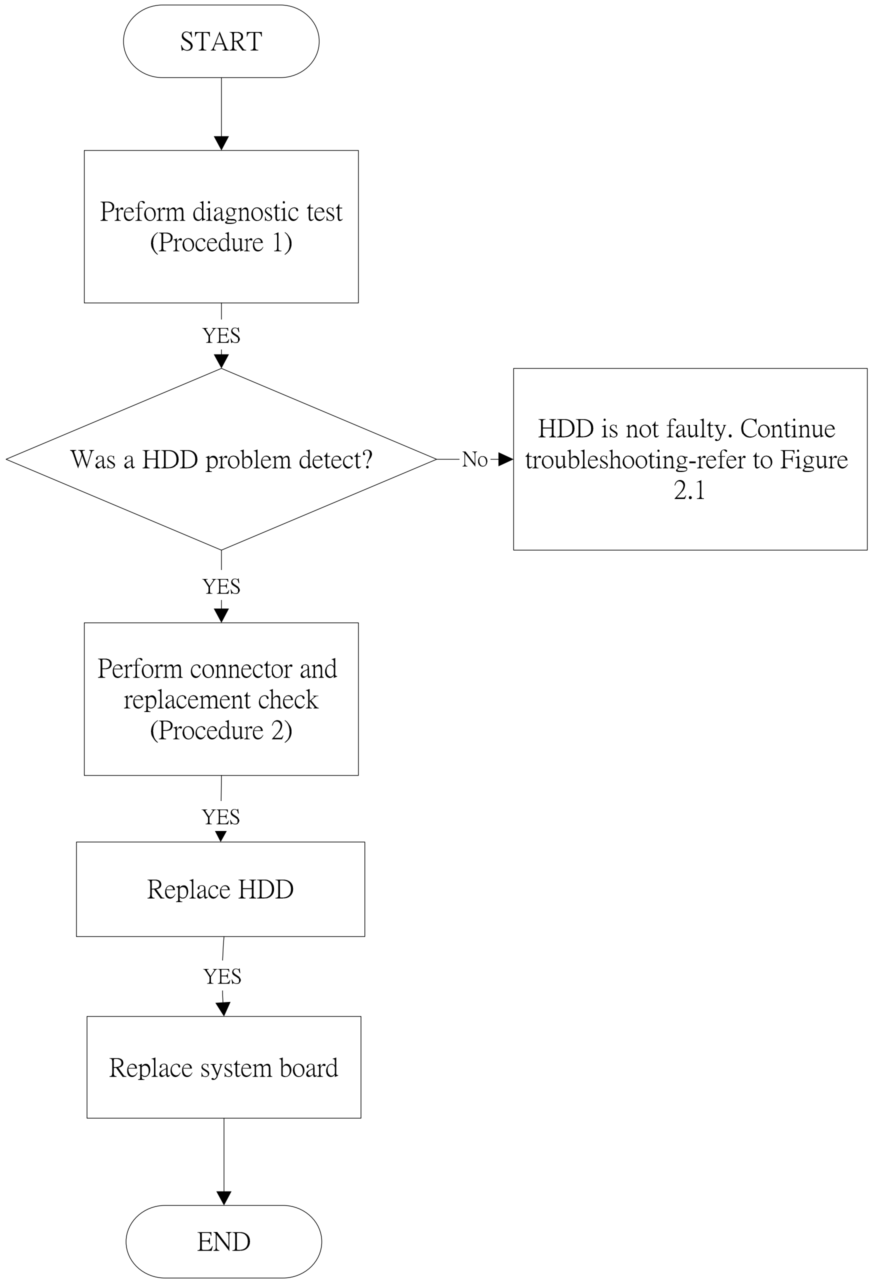


Figure 2-12 HDD troubleshooting process

The HDD or system board may be the reason of a HDD fault. Either of these two components may be damaged. To determine if the computer's HDD is functioning properly, perform the following procedures. Figure 2-15 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test
Procedure 2: Connector and replacement check

Procedure 1 Diagnostic test

Run the Diagnostic Program, which will automatically execute the HDD R/W test. Refer to Chapter 3, Tests and Diagnostics for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, the HDD function is functioning properly.

Procedure 2 Connector and replacement check

The HDD module or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1 Make sure that the HDD module is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2 The HDD module may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 3.

Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.13 CRT Troubleshooting

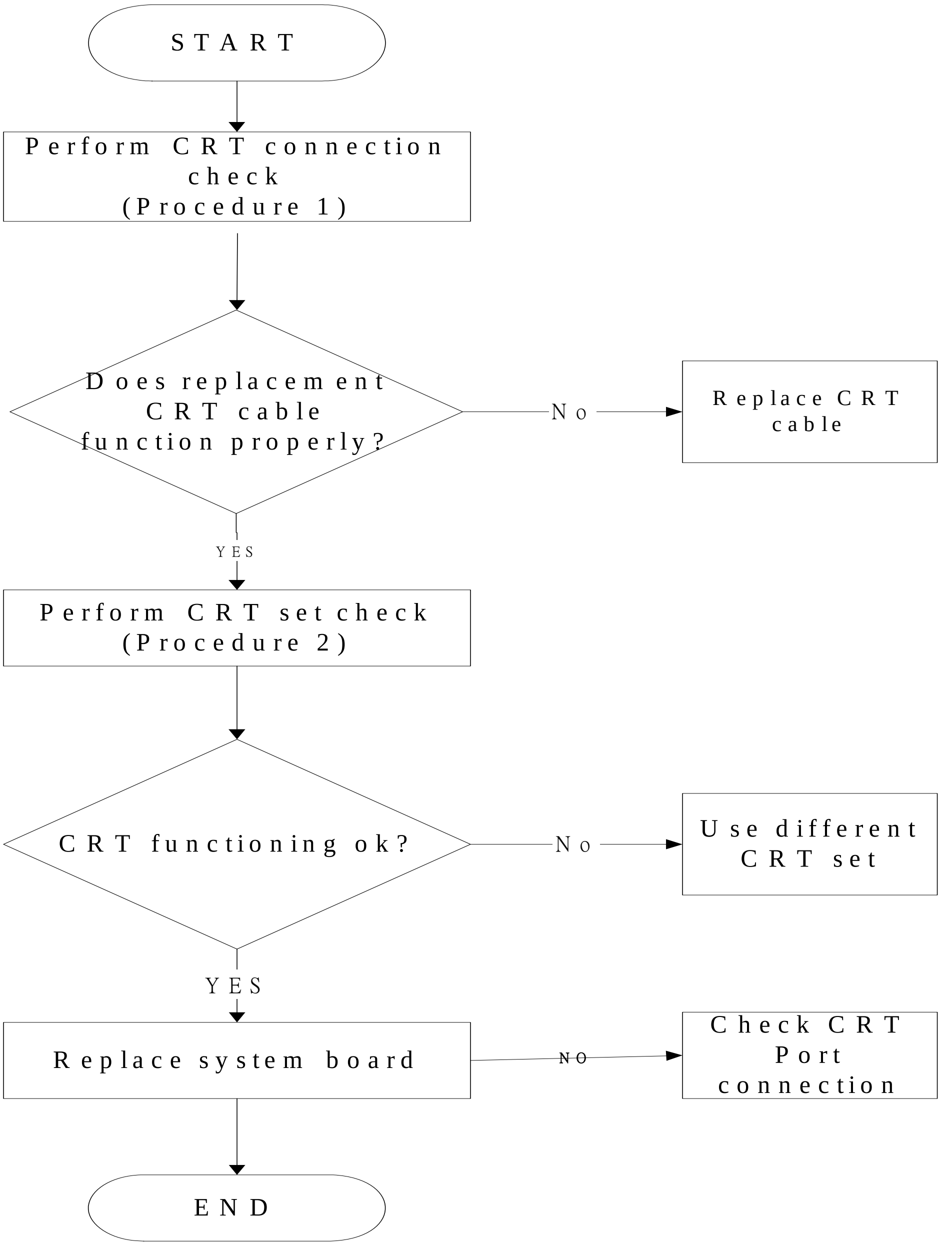


Figure 2-13 CRT troubleshooting process

To determine if the computer's CRT port is functioning properly, perform the following procedures. Figure 2-7 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1: CRT connection check

Procedure 2: CRT set check

Procedure 1 CRT connection check

The CRT cable may be damaged or the connections may be loose. Perform Check 1:

Check 1 Make sure CRT cable is firmly plugged into both the CRT set and the CRT port of the computer. If the cable is connected correctly, go to Check 2.

Check 2 Make sure the CRT port is firmly secured to the system board of the computer. If the malfunction remains, go to Check 3.

Check 3 The CRT cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2 CRT set check

The CRT set may be faulty. Perform Check 1:

Check 1 Try using the set for CRT reception. If it does not work, the set may be damaged. If the set does work, perform Check 2.

Check 2 Try connecting a different CRT to the computer. If the replacement CRT works, the original set may be damaged. If the replacement set does not work the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.14 LAN Troubleshooting

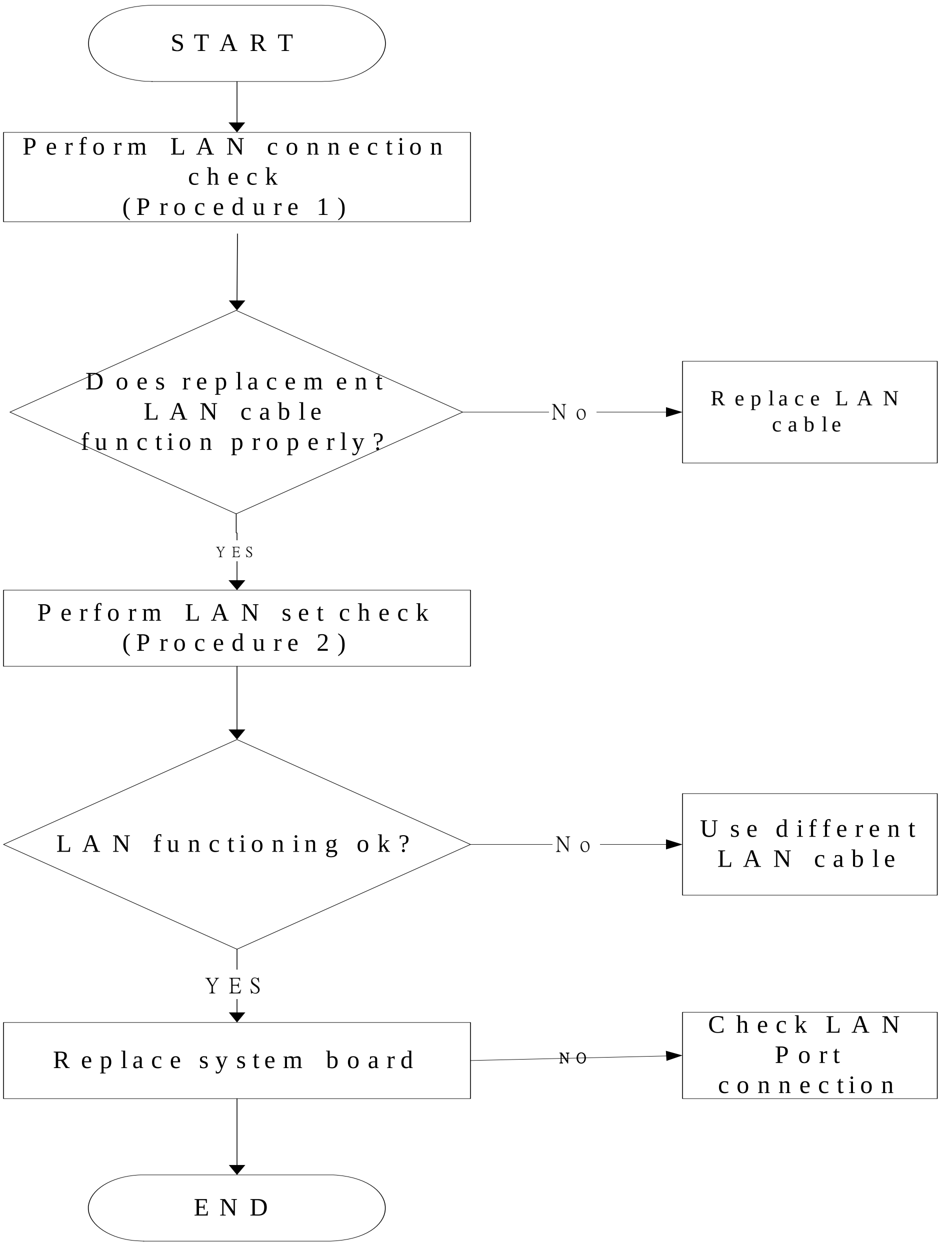


Figure 2-14 LAN troubleshooting process

To determine if the computer's LAN port is functioning properly, perform the following procedures. Figure 2-7 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1: LAN connection check

Procedure 2: LAN set check

Procedure 1 LAN connection check

The LAN cable may be damaged or the connections may be loose. Perform Check 1:

Check 1 Make sure LAN cable is firmly plugged into both the LAN set and the LAN port of the computer. If the cable is connected correctly, go to Check 2.

Check 2 Make sure the LAN port is firmly secured to the system board of the computer. If the malfunction remains, go to Check 3.

Check 3 The LAN cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2 LAN set check

The LAN set may be faulty. Perform Check 1:

Check 1 Try using the set for LAN reception. If it does not work, the set may be damaged. If the set does work, perform Check 2.

Check 2 Try connecting a different LAN cable to the computer. If the replacement LAN cable works, the original set may be damaged. If the replacement set does not work the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.15 MIC Troubleshooting

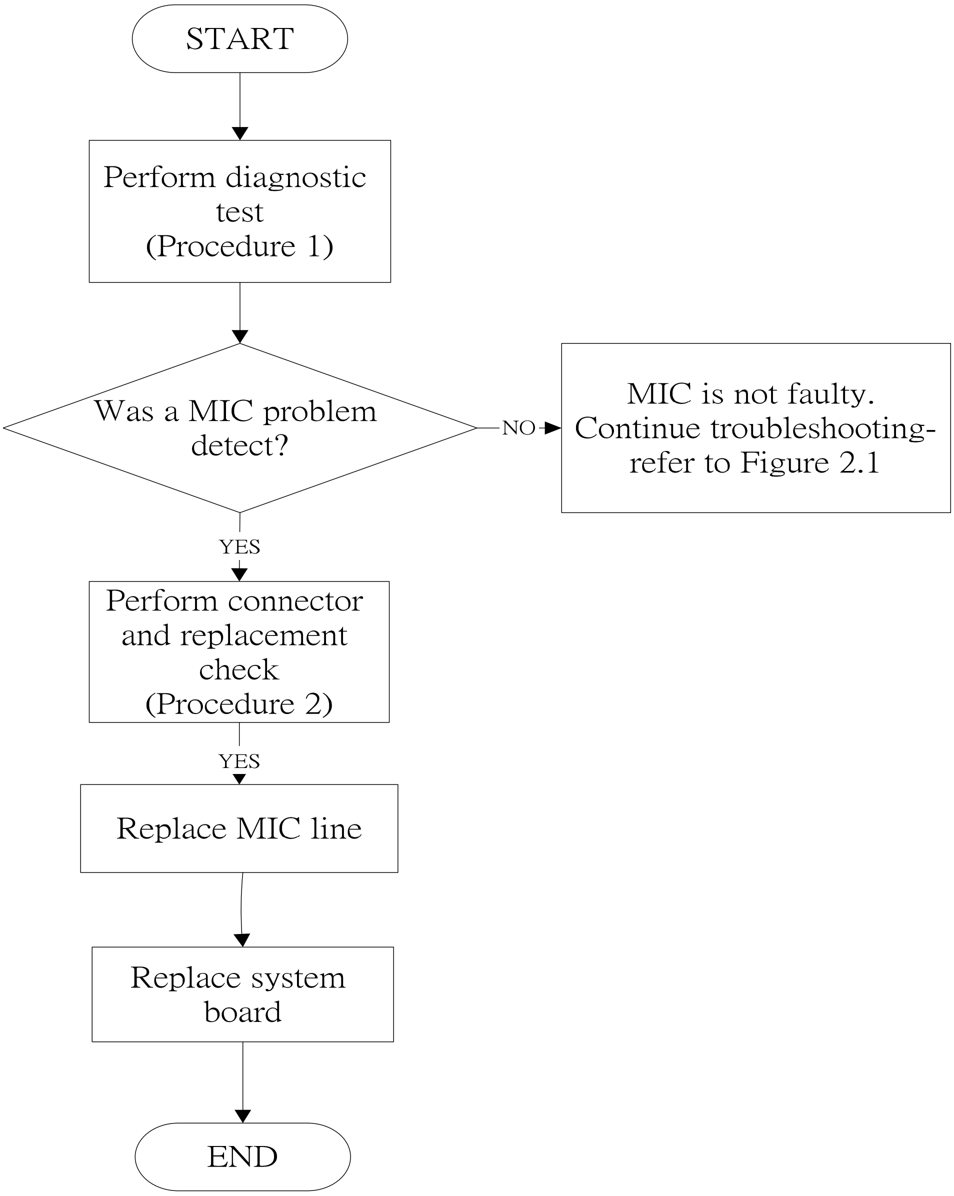


Figure 2.15. MIC troubleshooting process

The MIC line or system board may be the reason of a MIC fault. Either of these two components may be damaged. To determine if the computer’s MIC is functioning properly, perform the following procedures. Figure 2-15 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test

Procedure 2: Connector and replacement check

Procedure 1 Diagnostic test

Run the functioning Program on Windows model, which will display the MIC test result.

If tests and diagnostics result abnormal go to Procedure 2. If an error is not located, the MIC module functioning is properly.

Procedure 2 Connector and replacement check

The MIC line or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1 Make sure that the MIC line is securely slotted into the system board. If the problem remains, go to Check 2.

Check 2 The MIC line may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 3.

Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.16 3D Sensor Troubleshooting

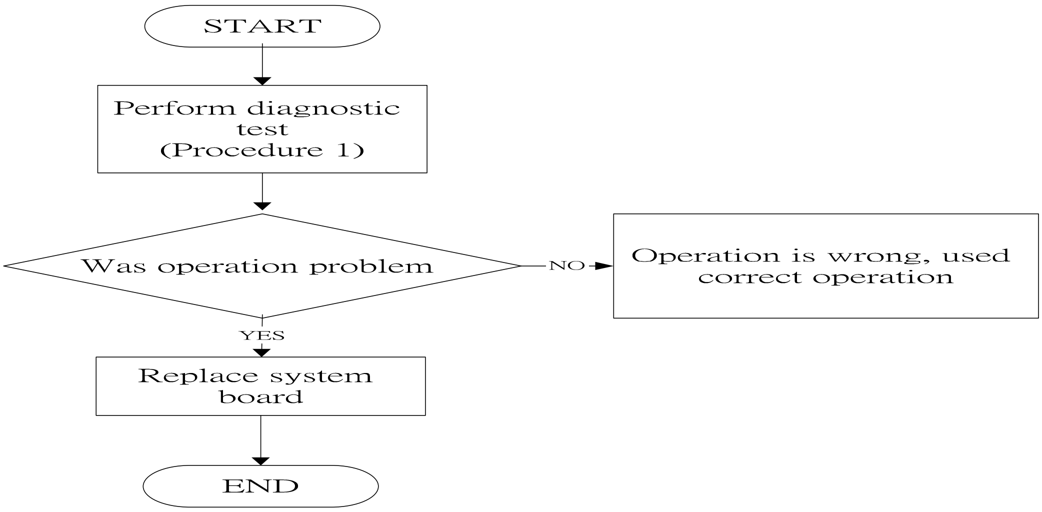


Figure 2.16. 3D sensor troubleshooting process

The operation or system board may be the reason of 3D sensor fault. Either of these two may be damaged. To determine if the computer's 3D is functioning properly, perform the following procedures. Figure 2-16 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test
Procedure 2: Replacement check

Procedure 1 Diagnostic test

Run the functioning Program on Windows model, which will display the 3D test result.

If tests and diagnostics result abnormal go to Procedure 2. If an error is not located, the 3D functioning is properly.

Procedure 2   Replacement check

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1   Make sure that 3D sensor test operation is correct, go to Check 2.

Check 2   The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2. 17 3G Troubleshooting

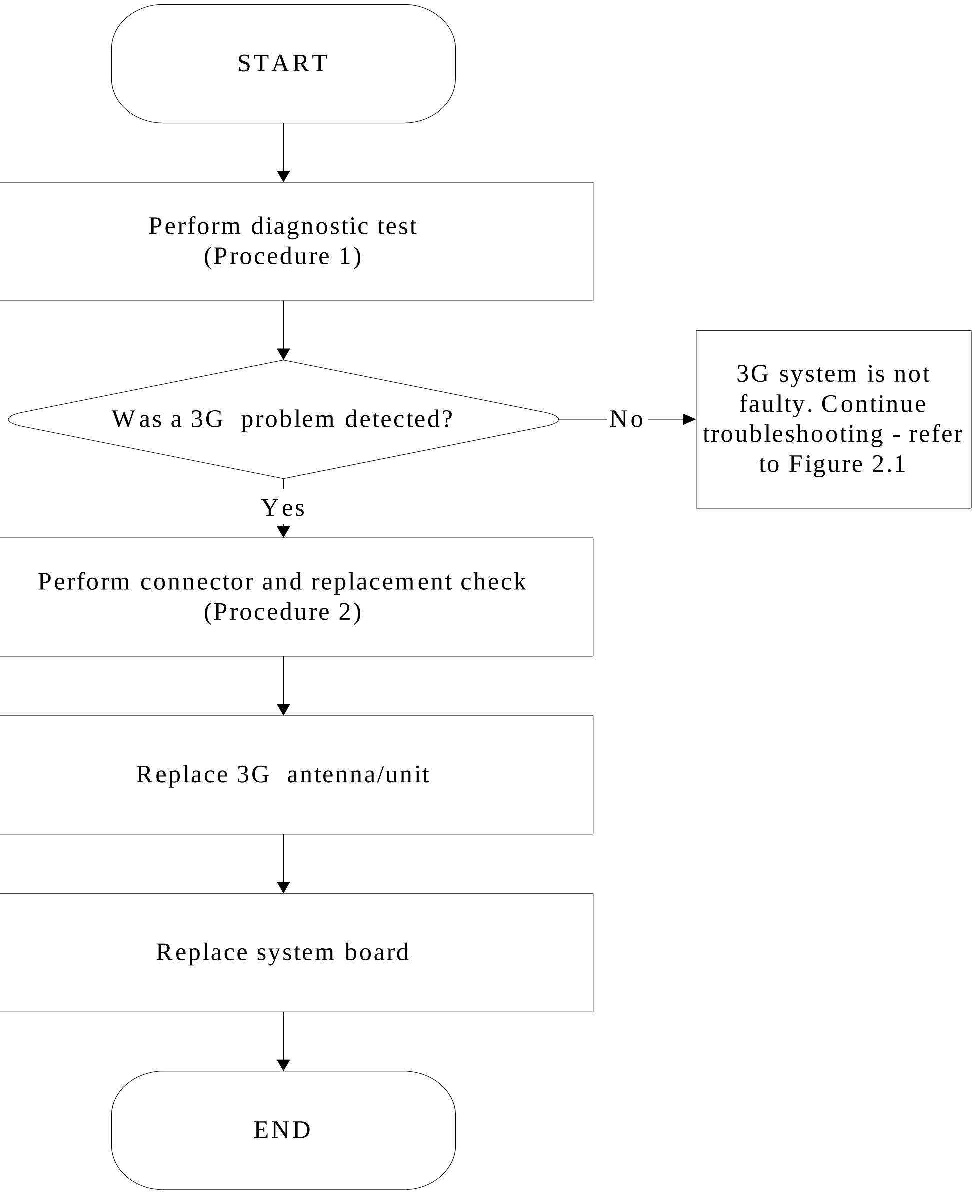


Figure 2-17 3G troubleshooting process

The 3G antenna wire, 3G unit or system board may each be the source of a 3G fault. Any of these components may be damaged. To determine if the computer's wireless LAN system is functioning properly, perform the following procedures. Figure 2-17 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test

Procedure 2: Connector and replacement check

Procedure 1 Diagnostic test

Run the Diagnostic Program, which will automatically execute the 3G test. Test and Diagnostic for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, 3G system is functioning properly.

Procedure 2 Connector and replacement check

The 3G antenna, 3G unit or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1 Make sure that the 3G antenna is firmly connected to the 3G module (refer to Chapter 4 for instructions) and that the 3G module is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2 Check the wireless communication function is enabled by BIOS setup and FN+F8, and then make sure that the wireless communication LED on the front panel is light. If the LED is light but the 3G function is still faulty, the antenna may be damaged. Replace with a new antenna following the steps in Chapter 4, *Replacement Procedures*. If the problem persists, or if the wireless LAN LED is not light when the wireless communication function is enabled by BIOS setup and FN+F8, go to Check 3.

Check 3 3G unit may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 4.

Check 4 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

Chapter 3

Tests and Diagnostics

3.1 The Diagnostic Test

This chapter explains how to use the Test & Diagnostic program to test the functions of the **(Base on Buffalo 10A/10B/10C/10BL T&D version 1.3)** hardware modules. The Test & Diagnostic Program is stored on the T&D diskettes. The program consists of a series of tests that run automatically when the Diagnostics Program items are selected and executed.

> ***NOTES:*** *To start the diagnostics, follow these steps*
>
> 1. *Check all cables for loose connections.*
> 2. *Exit this program when you are at Main Menu.*

The TEST & DIAGNOSTIC PROGRAM contains the following functional tests:

- ❑ CONFIG CHECK TEST
- ❑ Audio sound TEST
- ❑ FAN ON/OFF TEST
- ❑ MAIN BATTERY CHARGE TEST
- ❑ FDD TEST
- ❑ Memory check
- ❑ KEYBOARD TEST
- ❑ MOUSE(PAD) TEST
- ❑ LCD PIXELS MODE TEST
- ❑ MAGNETIC SWITCH TEST
- ❑ LAN TEST
- ❑ RTC TEST
- ❑ 3D G-sensor test
- ❑ 1st HDD Test
- ❑ RDMI Test
- ❑ WDMI Test
- ❑ Memory Test
- ❑ Toshiba Logo set
- ❑ Dynabook Logo set
- ❑ TP TYPE R/W TEST
- ❑ EEPROM Setting

You will need the following equipment to perform some of the Diagnostic test programs.

- ❑ The diagnostics USB disk
- ❑ A formatted working diskette for the floppy disk drive test (Floppy Disk Drive Test)
- ❑ A LAN loopback

3.2 Executing the Diagnostic Test

DOS is required to run the DIAGNOSTICS PROGRAM. To start the DIAGNOSTIC PROGRAM, follow these steps:

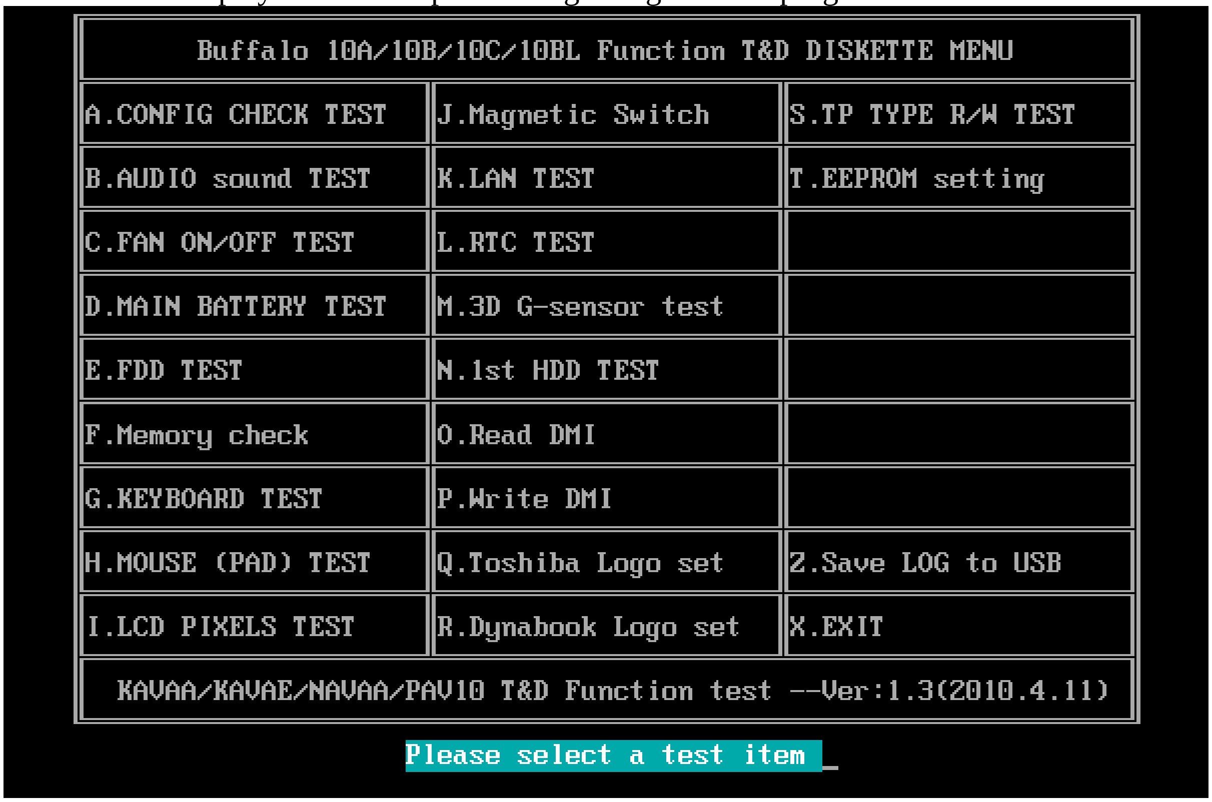
Insert the diagnostics USB disk drive and turn on the computer. (The diagnostics diskette contains the DOS boot files.) And then follow the instructions for T&D program installed in RAM driver.

The T&D Program can run single test by you press corresponsive English letter of test item, and it also asks you if you like to copy test log file to USB disk as reference at the end of test(s).

The test list is as the following:

A. CONFIG CHECK TEST
B. Audio sound TEST
C. FAN ON/OFF TEST
D. MAIN BATTERY TEST
E. FDD TEST
F. Memory check
G. KEYBOARD TEST
H. MOUSE (PAD) TEST
I. LCD PIXELS MODE TEST
J. MAGNETIC TEST
K. LAN TEST
L. RTC TEST
M. 3D G-SENSOR TEST
N. 1st HDD Test
O. RDMI Test
P. WDMI Test
Q. Toshiba Logo set
R. Dynabook Logo set
S. TP TYPE R/W TEST
T. EEPROM Setting

The below display will show up at the beginning of T&D program



If the test result passes, the following display will show up:



If an error is detected and a test fails, the following message displays:



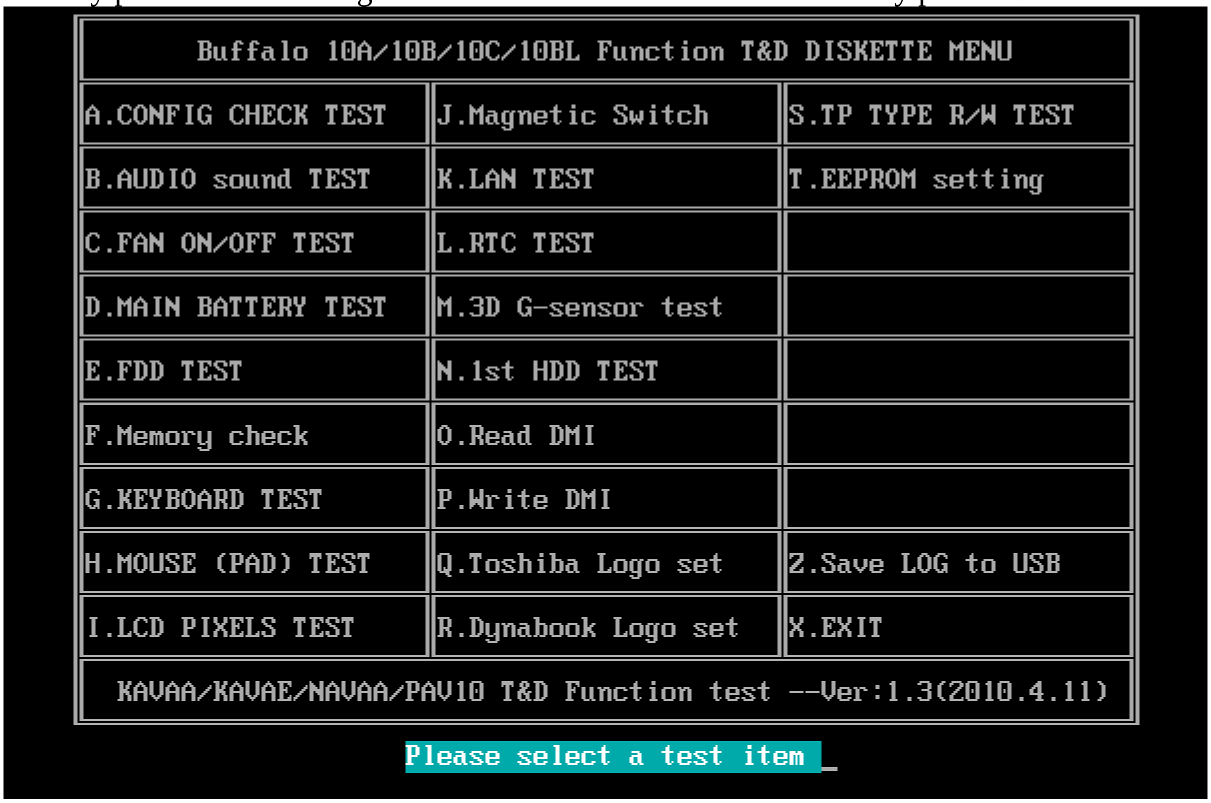
Then press any key for next actions – the below display presented if copying test log file onto diskette is necessary. This action will be executed when "**Y**" key pressed.

Buffalo 10A/10B/10C/10BL Function T&D DISKETTE MENU		
A.CONFIG CHECK TEST	J.Magnetic Switch	S.TP TYPE R/W TEST
B.AUDIO sound TEST	K.LAN TEST	T.EEPROM setting
C.FAN ON/OFF TEST	L.RTC TEST	
D.MAIN BATTERY TEST	M.3D G-sensor test	
E.FDD TEST	N.1st HDD TEST	
F.Memory check	O.Read DMI	
G.KEYBOARD TEST	P.Write DMI	
H.MOUSE (PAD) TEST	Q.Toshiba Logo set	Z.Save LOG to USB
I.LCD PIXELS TEST	R.Dynabook Logo set	X.EXIT
KAVAA/KAVAE/NAVAA/PAV10 T&D Function test --Ver:1.3(2010.4.11)		

Please select a test item _

It will skip this process if “N” key pressed.

And then it will check if it’s necessary to leave this program. Program will quit when “**Y**” key pressed and it will go back main menu for next test if “**N**” key pressed.



Buffalo 10A/10B/10C/10BL Function T&D DISKETTE MENU		
A.CONFIG CHECK TEST	J.Magnetic Switch	S.TP TYPE R/W TEST
B.AUDIO sound TEST	K.LAN TEST	T.EEPROM setting
C.FAN ON/OFF TEST	L.RTC TEST	
D.MAIN BATTERY TEST	M.3D G-sensor test	
E.FDD TEST	N.1st HDD TEST	
F.Memory check	O.Read DMI	
G.KEYBOARD TEST	P.Write DMI	
H.MOUSE (PAD) TEST	Q.Toshiba Logo set	Z.Save LOG to USB
I.LCD PIXELS TEST	R.Dynabook Logo set	X.EXIT
KAVAA/KAVAE/NAVAA/PAV10 T&D Function test --Ver:1.3(2010.4.11)		

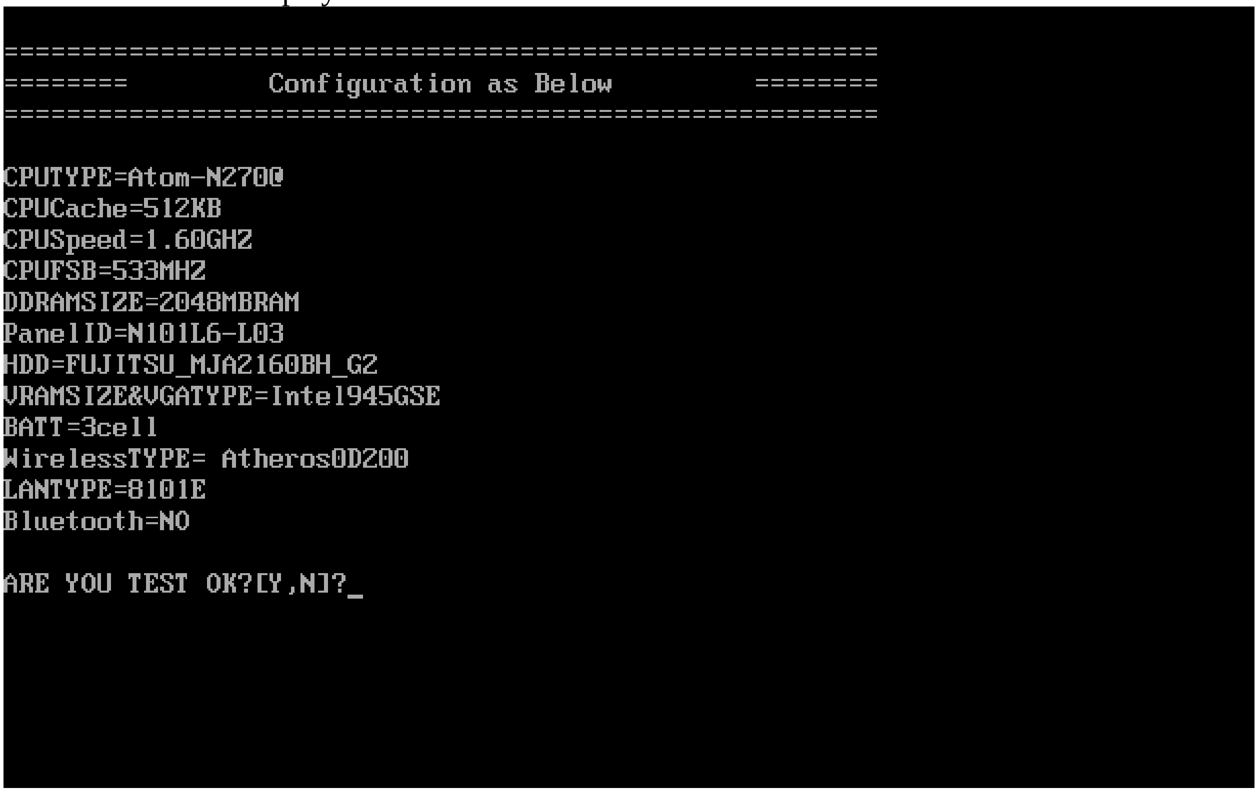
Please select a test item _

3.3 Display Configuration

This Item will show the unit configuration. It includes:

- CPU (CPU type)
- DDRAM SIZE
- Panel ID
- HDD1 type & capacity (Vendor ID. Model .Firmware)
- VRAM size / VGA CHIP TYPE
- Battery cell (3cell;6cell)
- Wireless type
- LAN Type
- Bluetooth

The screen should display as below:

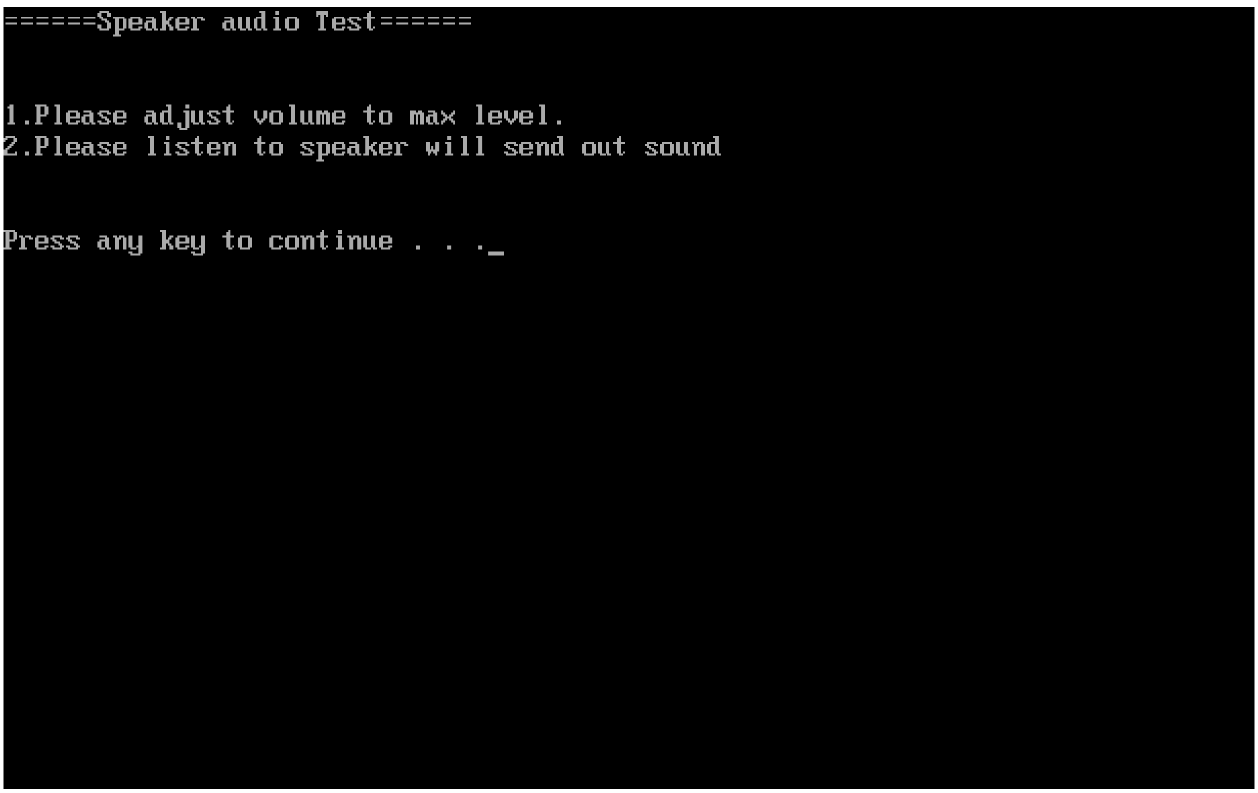


3.4 Audio sound test

The audio sound test allows the user to aurally confirm the speaker functions. And the speaker will send out music during test.

> ***NOTE**: Remember to tune up the volume as "**Maximum**" before this test starts.*
>
> *Buffalo only have one speaker, no need test Left/Right Speaker*

The screen should display as below, indicating whether the test is passed or failed after the question.



3.5 Fan ON/OFF Test

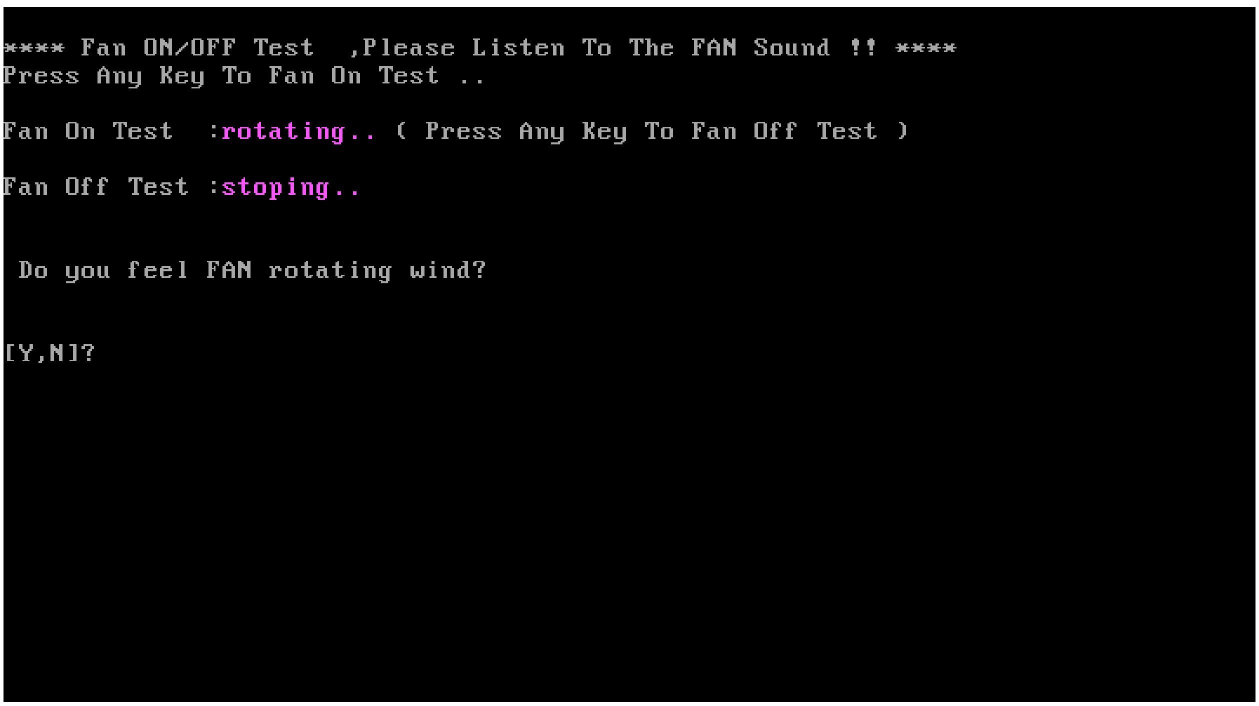
The fan test allows the user to test aurally whether the fan is working. And follow the below procedures for this test:

- The computer will let the fan be “ON” after any key pressed. Feel the wind or listen the rotating sound to check whether the fan is working or not.

> ***NOTE***: *Remember to approach fan outlet that is near right side of unit whether fan is “ON”.*

- The computer will stop the fan working after any key pressed. Feel the wind or listen the sound to check if the fan is “OFF”.

The screen should display as below, indicating whether the test is passed or failed after the question.



3.6 Main Battery Charge Test

NOTE: *The AC adaptor should be connected to successfully run this test*

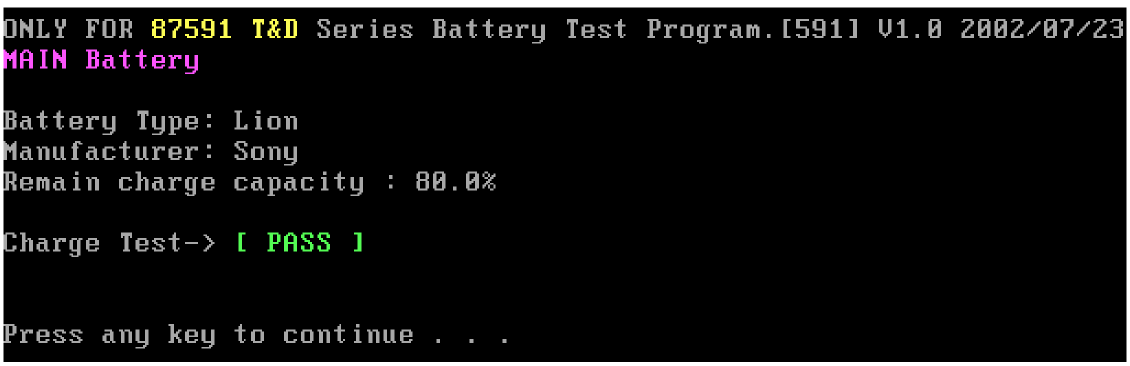
. 30W with 19V DC for ALL SKU

This test shows and measures the main battery:

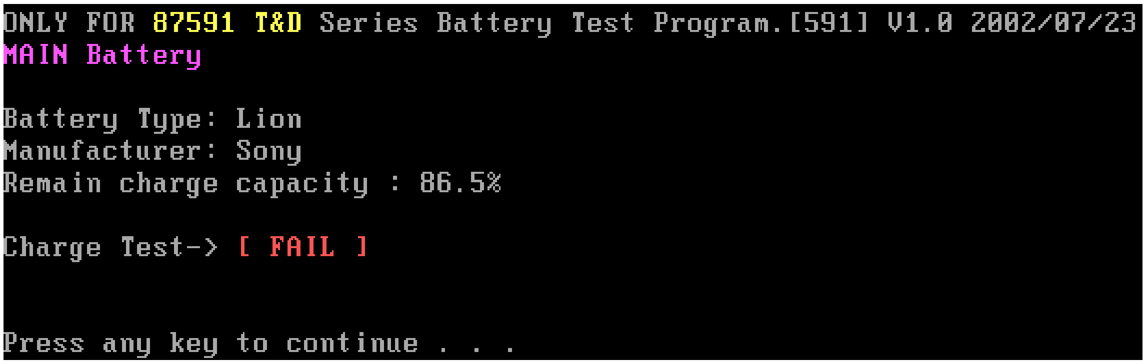
- Battery type (Lion)
- Manufacturer (Sanyo/Panasonic/Sony)
- Remain charge capacity (0 ~ 100%)
- Charge function (PASS/FAIL)

- "Battery Is Full" showed when "remain charge capacities" is 100%

The screen should display as below, if the charge function is OK, will show:.



If the charge function is NG, the screen will display as:



3. 7 FDD Test

***NOTE**: Before running the FDD test, prepare a formatted work diskette (1.44 MB). Need to insert FDD when power on machine. Otherwise the Floppy can be not detected.*

The Floppy Disk Test includes three subtests of the:

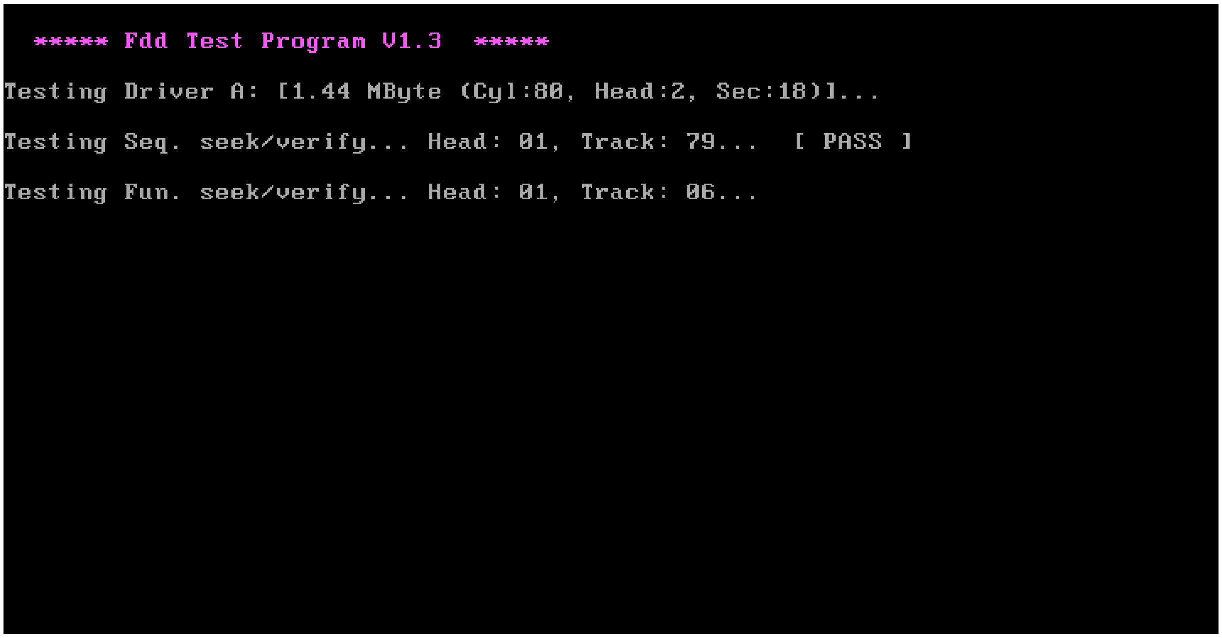
1. Sequential seek/verify function (Range: Track 0 ~ 79)
2. Funnel code seek/verify function (Range: Track 0 ~ 79)
3. Write/Read/Compare pattern function (Range: Track 75 ~ 79)

***NOTE**: The write-protected device of this formatted diskette should be "Disable".*

The subtests run automatically.

***NOTE**: Press "**Esc**" key can skip the current subtest.*

The screen should display as below, indicating whether the subtests pass or fail when finished.

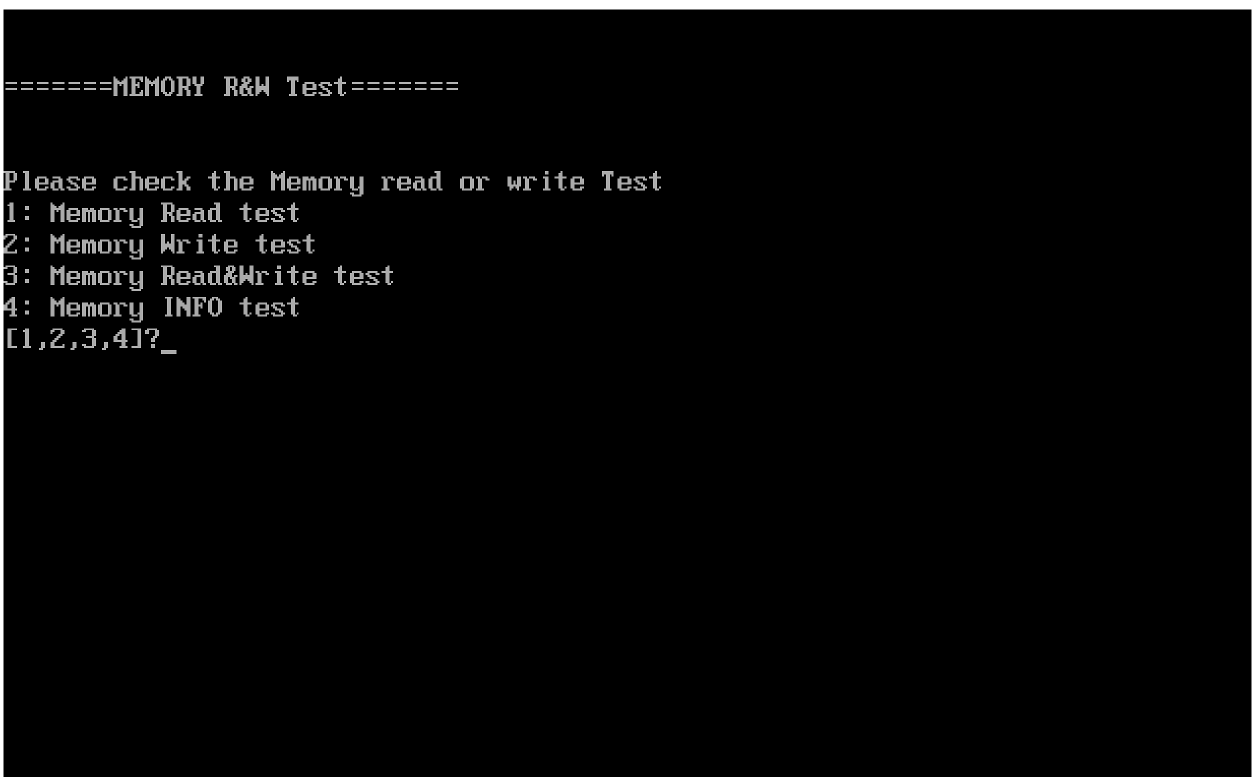

***** Fdd Test Program V1.3 *****
Testing Driver A: [1.44 MByte (Cyl:80, Head:2, Sec:18)]...
Testing Seq. seek/verify... Head: 01, Track: 79... [PASS]
Testing Fun. seek/verify... Head: 01, Track: 06...

3.8 Memory check

This test will check if the computer's Memory Frequency and Size is correct in every slot.

Before Memory test start, you should choice the below item:

1. Memory Read test
2. Memory Write test
3. Memory Read & Write test
4. Memory INFO test



3. 9 Keyboard Test

The keyboard test checks the all keys function.

NOTE: *The **Num Lock** and the **Overlay** mode must be off to execute the keyboard test.*

Before keyboard test starts, the keyboard matrix code should be chosen as below display:

1. **S** (US, for America)
2. **J** (Japan, for Japan)
3. **K**(UK, for Europe)

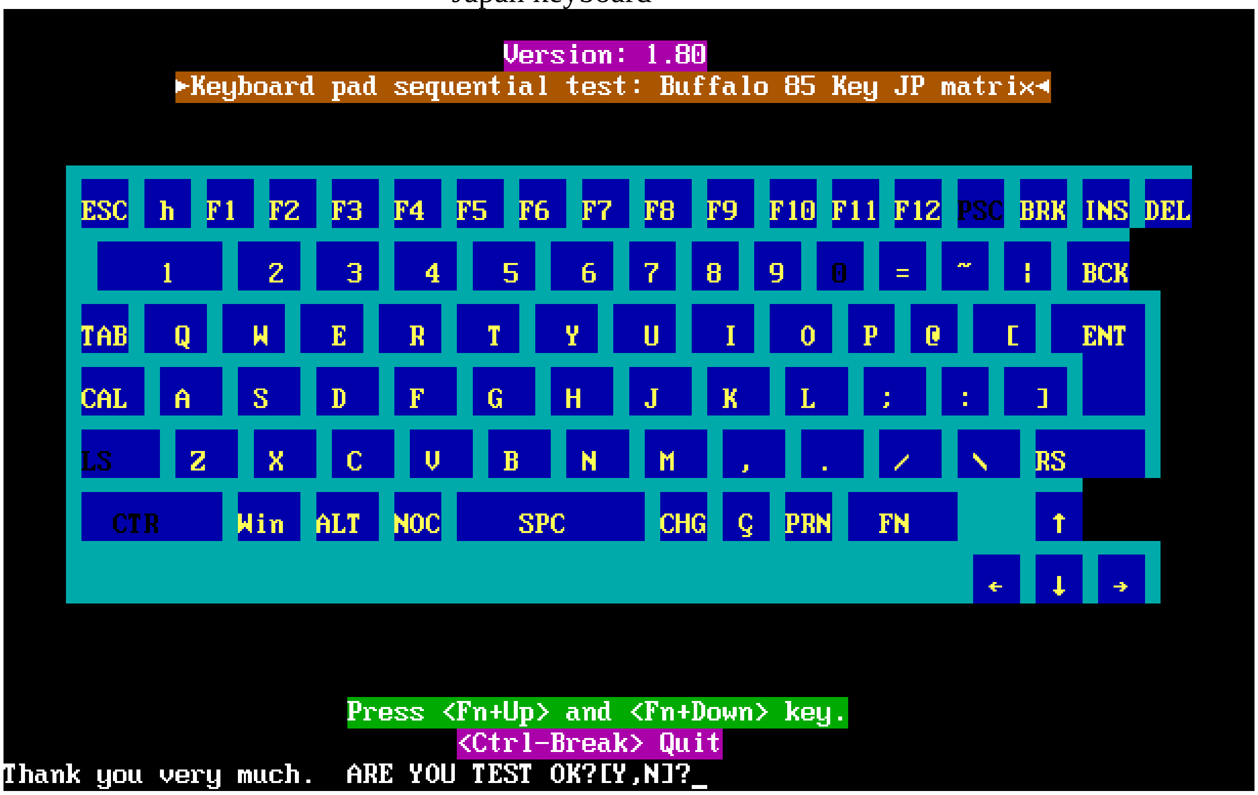
When you execute this test, the keyboard layout is drawn on the display. When any key is pressed, the corresponding key on the screen changes to black as shown below.

It will indicate whether the sub test is passed or failed after the question.

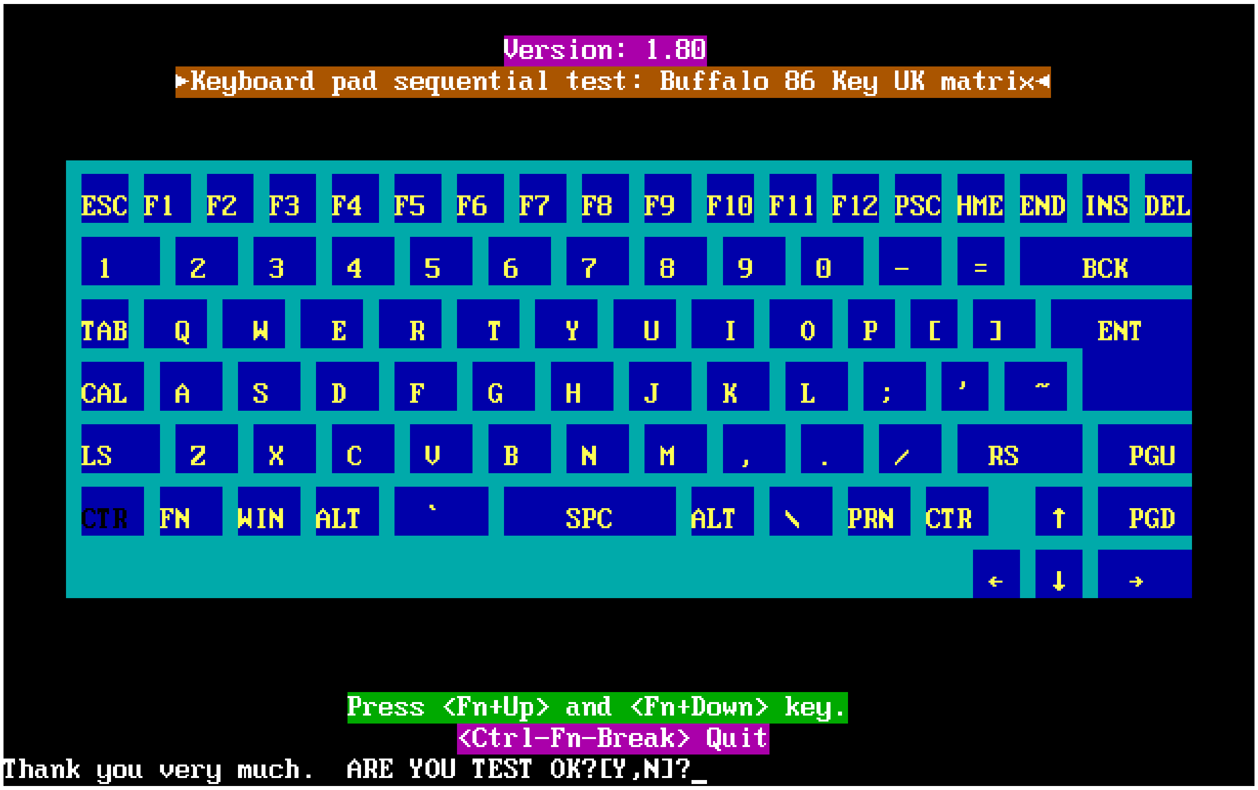
US Keyboard



Japan keyboard



UK keyboard



NOTE: *The "**Fn**" key cannot be tested in the keyboard test. To determine whether the "**Fn**" key is working correctly, press "**Fn+F6** " or "**Fn+F7** " keys to check if LCD display brightness change gradually.*

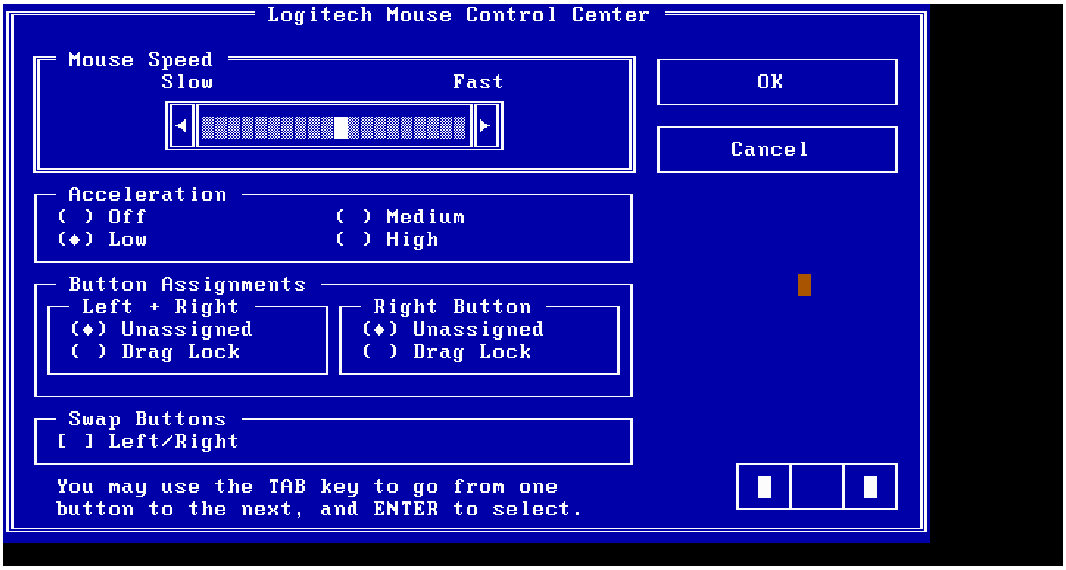
3.10 Mouse (Pad) Test

The Mouse test allows the user to select and assign values to the following, using the Touch Pad or "***Tab***" key to move between selections:

1. Mouse Speed (on a scale from slow to fast)
2. Acceleration (Off, Low, Medium, High)
3. Button Assignments (Left + Right / Right button, either Unassigned or Drag Lock)
4. Swap Buttons (Left /Right)

NOTE: *The Touch Pad test cannot be used to test an external USB mouse.*

The Touch Pad button subtest allows users to test their Touch Pad buttons. If the buttons are clicked, the cursors should appear in the corresponding box of the button figure that is displayed on the screen as below.



After checking T/Pad buttons and cursor's function, use "Tab" key or use T/Pad cursor to click the "OK" column will end this test.

It will indicate whether the subtests pass or fail after three questions.

NOTE: *The above figure has three compartments although the Touch Pad installed may only have two buttons. In this case, the central compartment in the figure does not correspond to any button.*

3.11 LCD Pixels Mode Test

This LCD pixels mode test checks whether video display is fine.

This test includes two modes of the test:

1. Text Mode

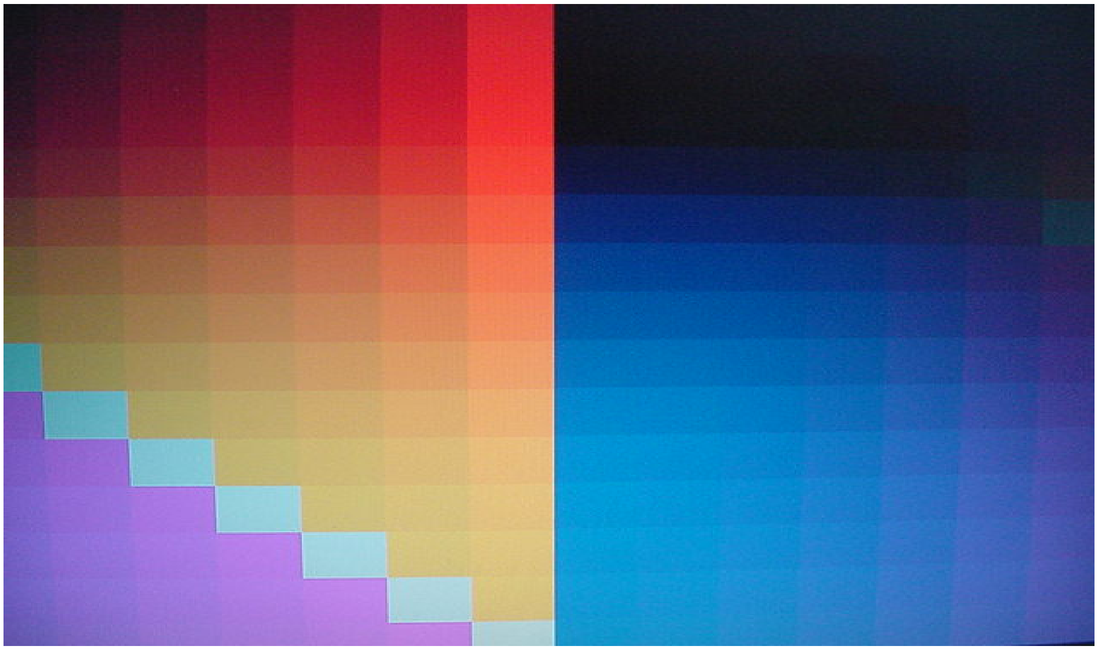
   - including 40*25 (16 colors) and 80*25 (2/16colors).

2. VGA Mode

   - including 320*200 (4/16/256 colors), 640*200 (2/16 colors), 640*350 (2/16 colors),

640*480 (2/16/256 colors), 800*600 (256 colors) and 1024*768 (256 colors).

The screen should display as below, indicating whether the test is passed or failed after the question.



3.12 Magnetic Switch Test

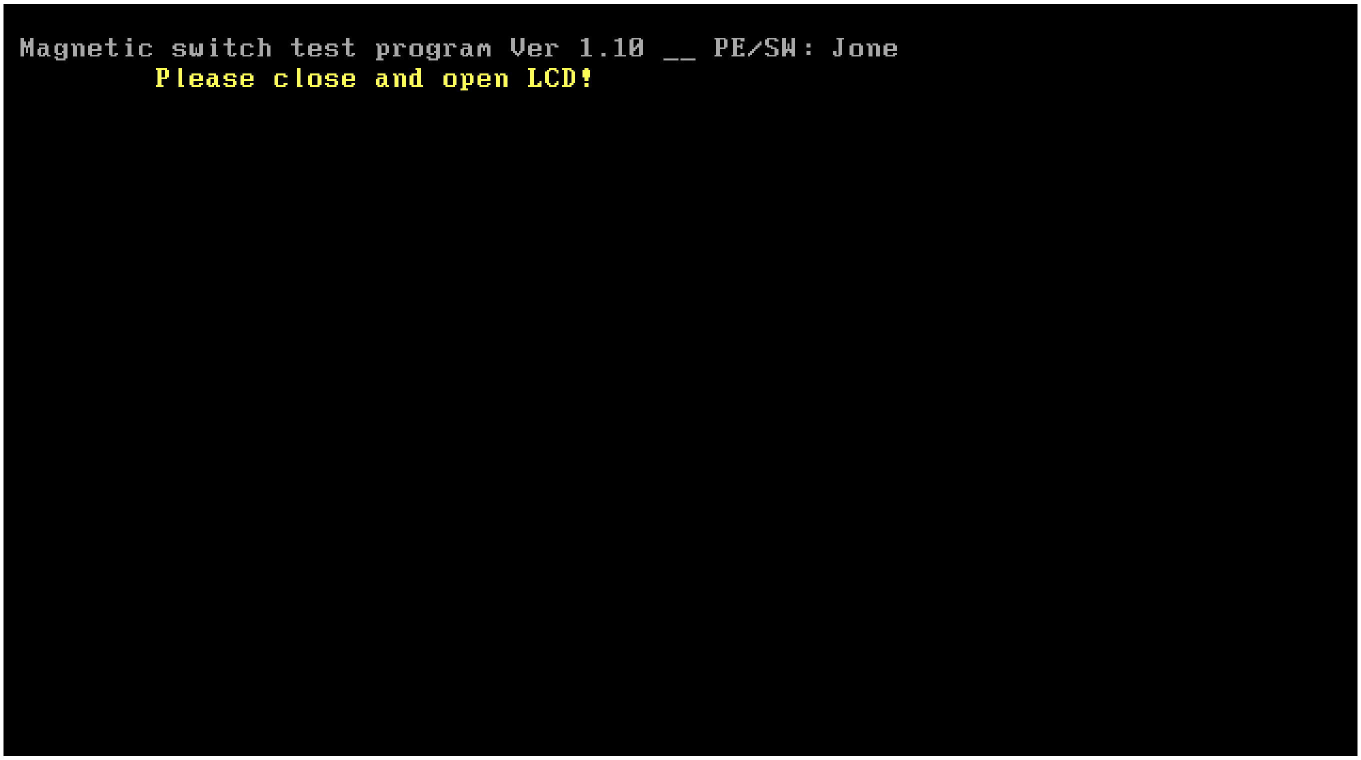
The Magnetic switch test checks the Magnetic function of the unit. When LCD cover closed, the Magnetic should enable to turn off the display.

Follow below steps to run this test:

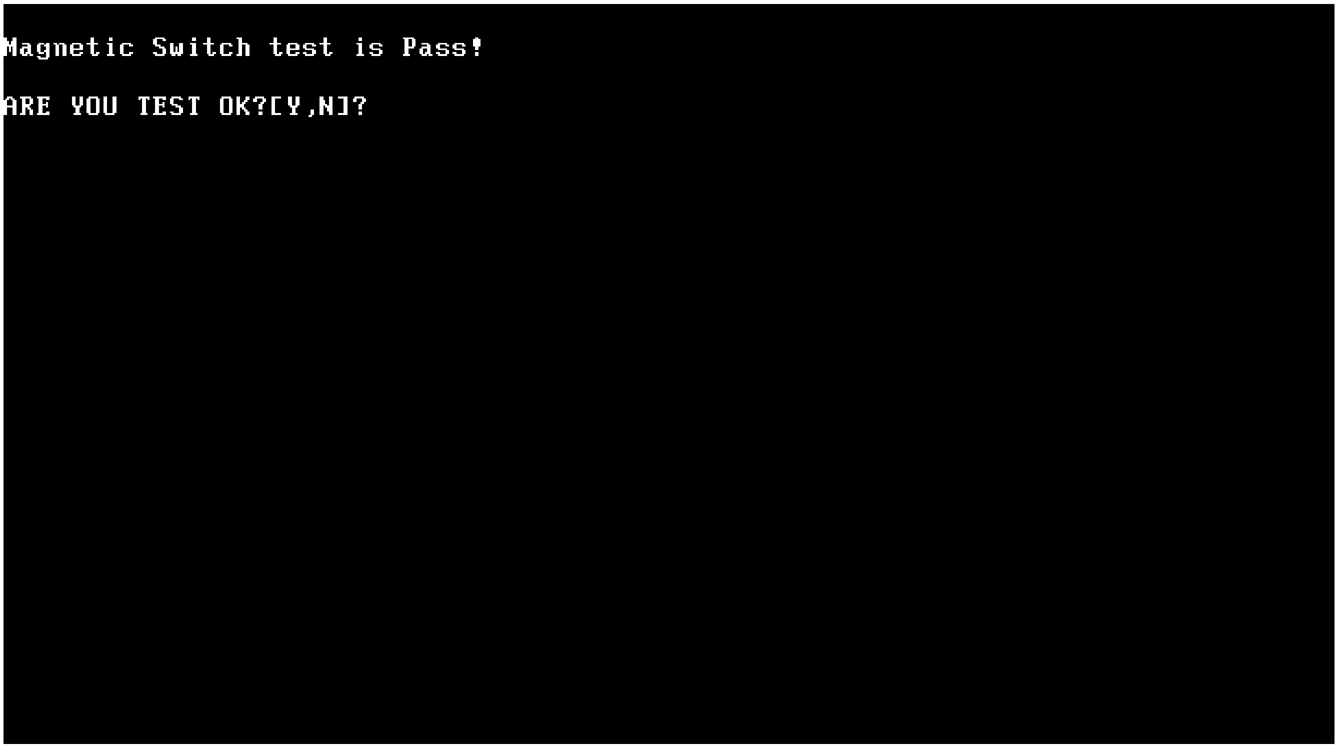
1. Close the LCD cover.
2. Open the LCD.

Then it will indicate whether the test is passed or failed.

1>. If the Magnetic switch test fail, it will show below display:



2>. If the Magnetic switch test pass, it will show below display:



3.13 LAN Test

The LAN test checks the LAN full-duplex environment.

> ***NOTE:*** *LAN loopback needs to plug in before test begins.*

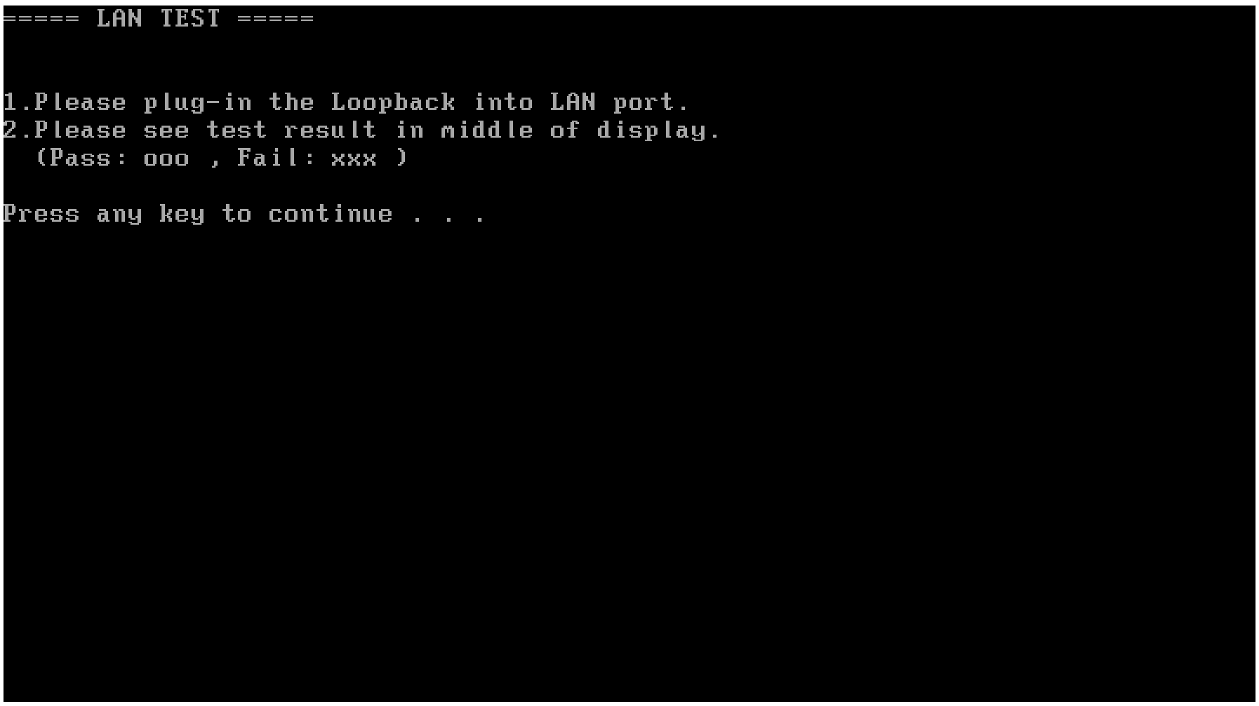
And LAN information will show on the test screen:

- IO Base – Port: A000H
- IRQ – BH, it's "IRQ B".
- Node – it is "MAC Address".
- Line Speed – 1000Mbps or 100Mbps or 10 Mbps.
- Bus ID – it's "14".

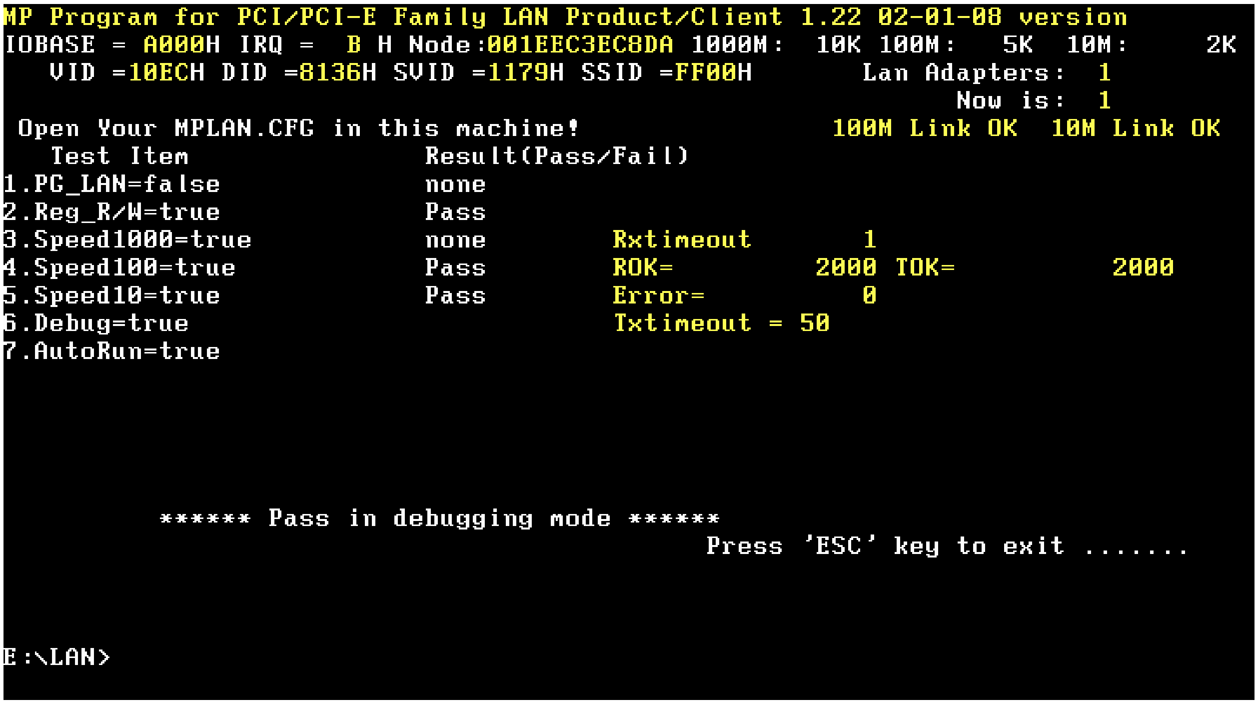
The LAN test includes three subtests of the:

1. Speed1000
2. Speed100
3. Speed10

The subtests run automatically.



The screen should display as below, indicating whether the subtests pass or fail when finished.



If an error is detected and a test fails, the following message displays:

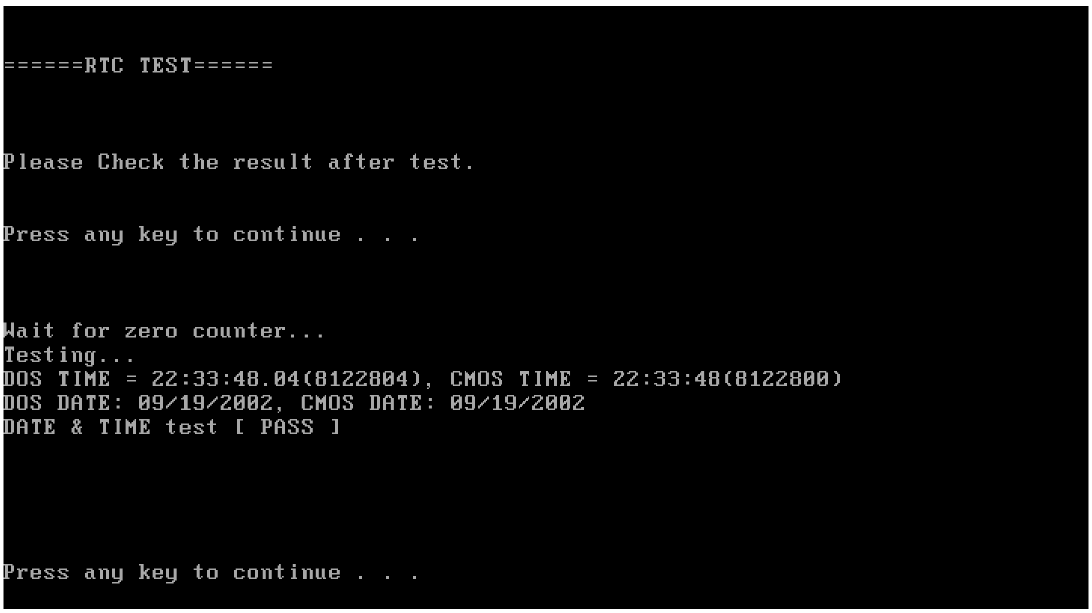


3.14 RTC Test

Checks the computer's RTC (Real Time Clock) and calendar functions by comparing the DOS and CMOS values.

The test runs automatically.

The screen should display as below, indicating whether the test is passed or failed when finished.

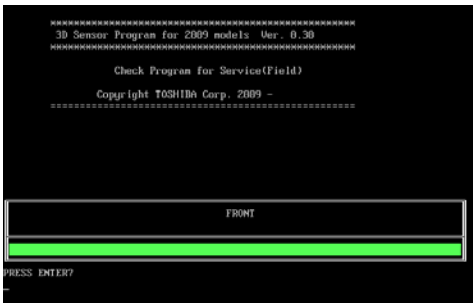


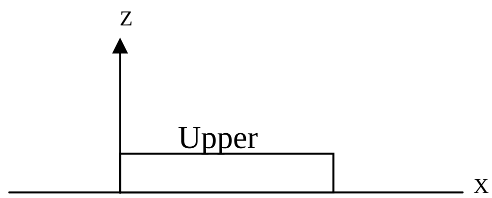
3.15 3D G-sensor test

NOTE: *please keep 90 degree between logic upper and LCD panel when test*

The display of a test program and the set method of PC are shown below.

Display of a Test Program,The portion which PC and Test-Fixture contact is green.

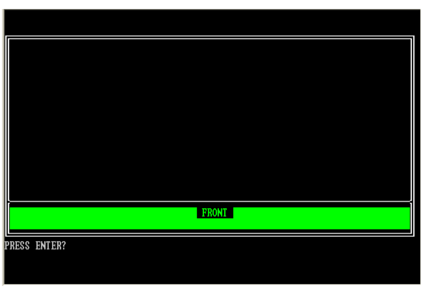


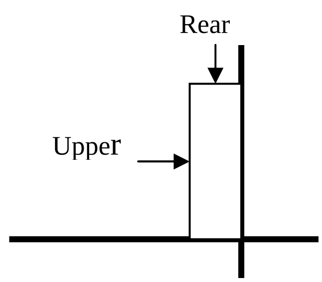


Set method of PC <A>

If the picture shows as below, it means the 3D G-sensor function is OK

Test 2 :

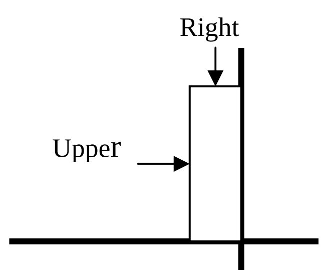




Set method of PC <B>

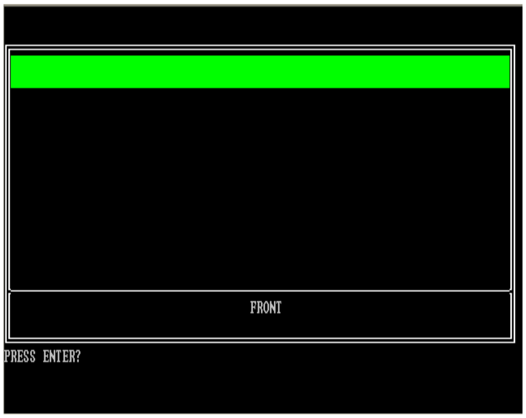
Test 3:

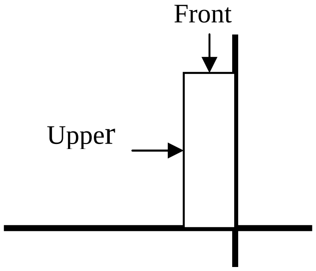




Set Method of PC <3>

Test 4:

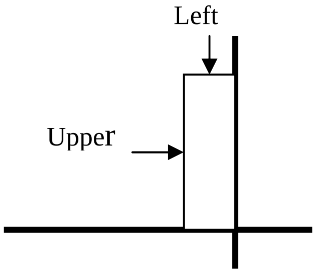




Set method of PC <4>

Test 5:



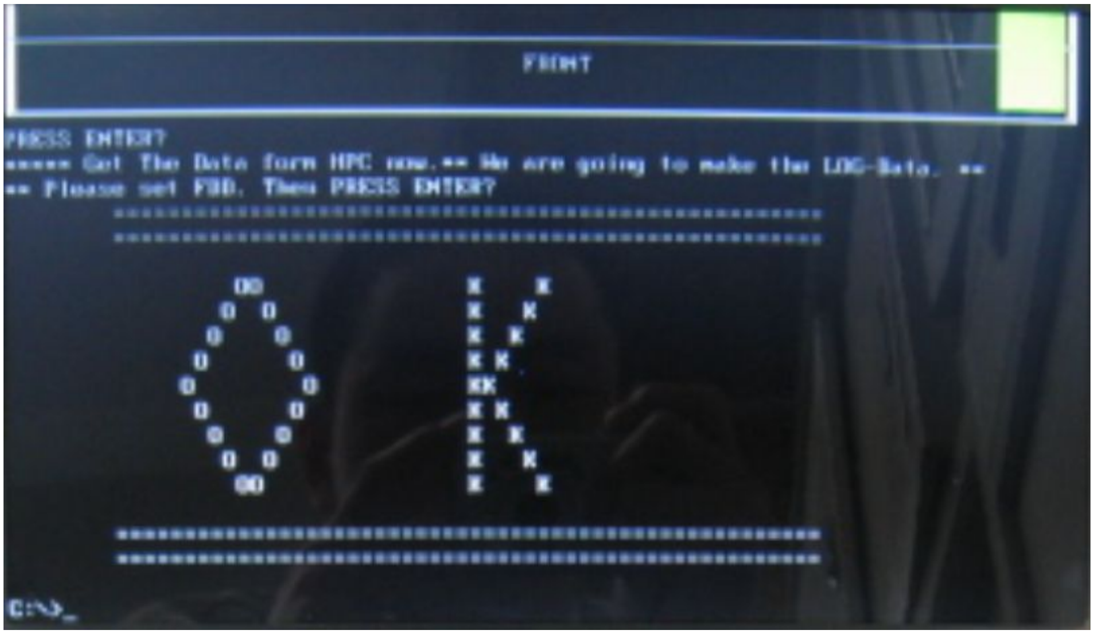


Set method of PC <5>

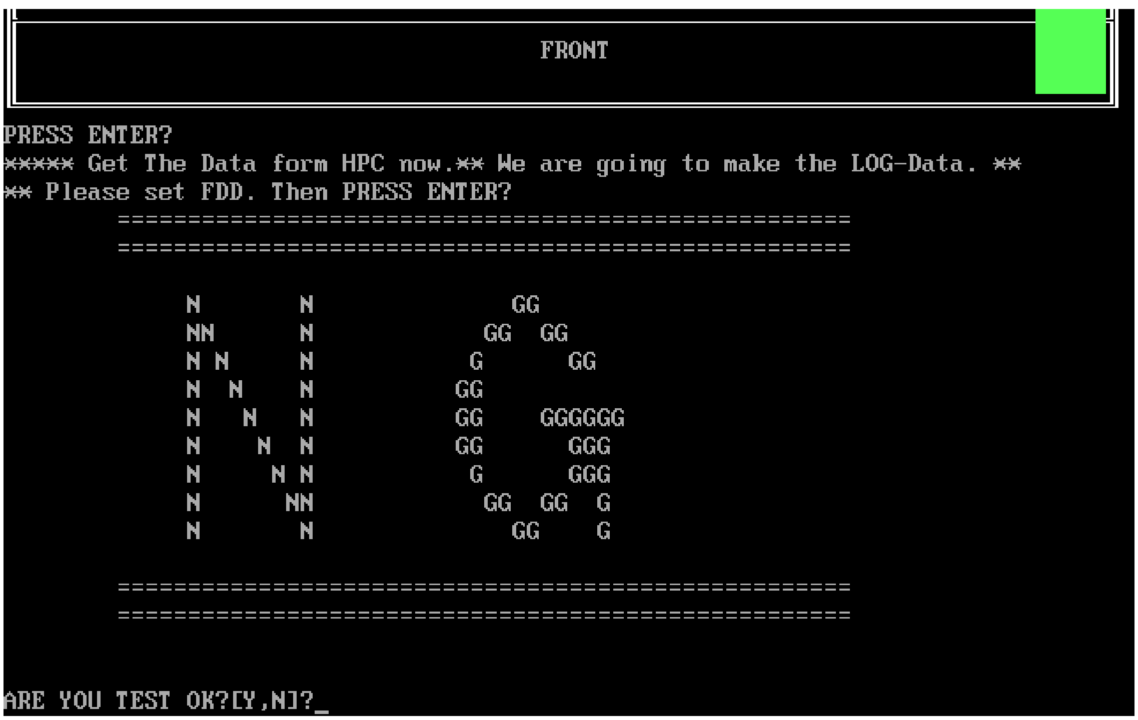
Test Result

A test result is displayed when a test is completed. A display of result is O.K. or NG.

And an error flag is returned at the end of a program.



If the picture shows as below, it means the 3D G-sensor function is NG

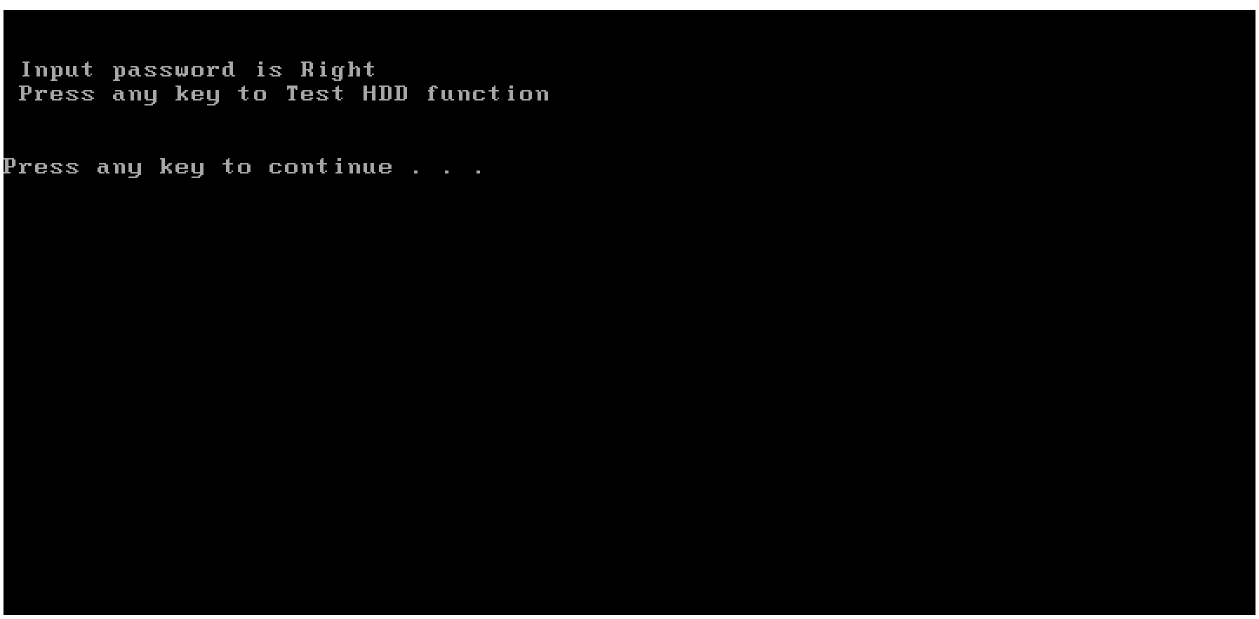


3.16 1st HDD Test

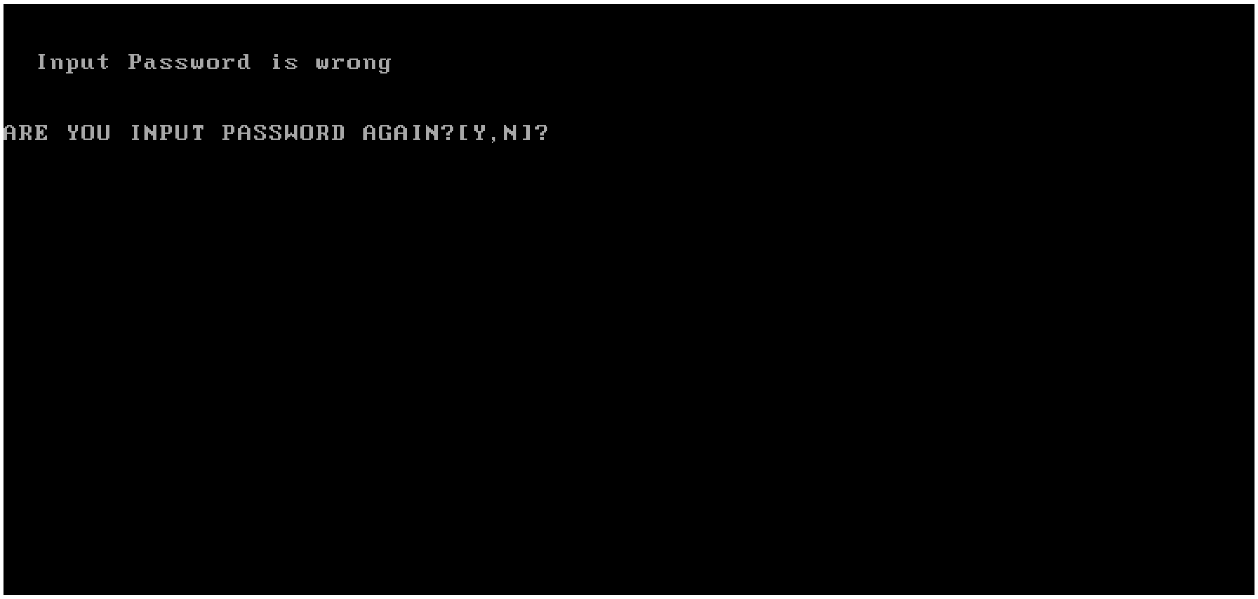
The HDD test allows the user to verify the 1st HDD ok or not. First, please select HDD test method, Screen would display as below:



After you select the method, then input password: “hard disk”, if input password is Right, the screen would display as below:

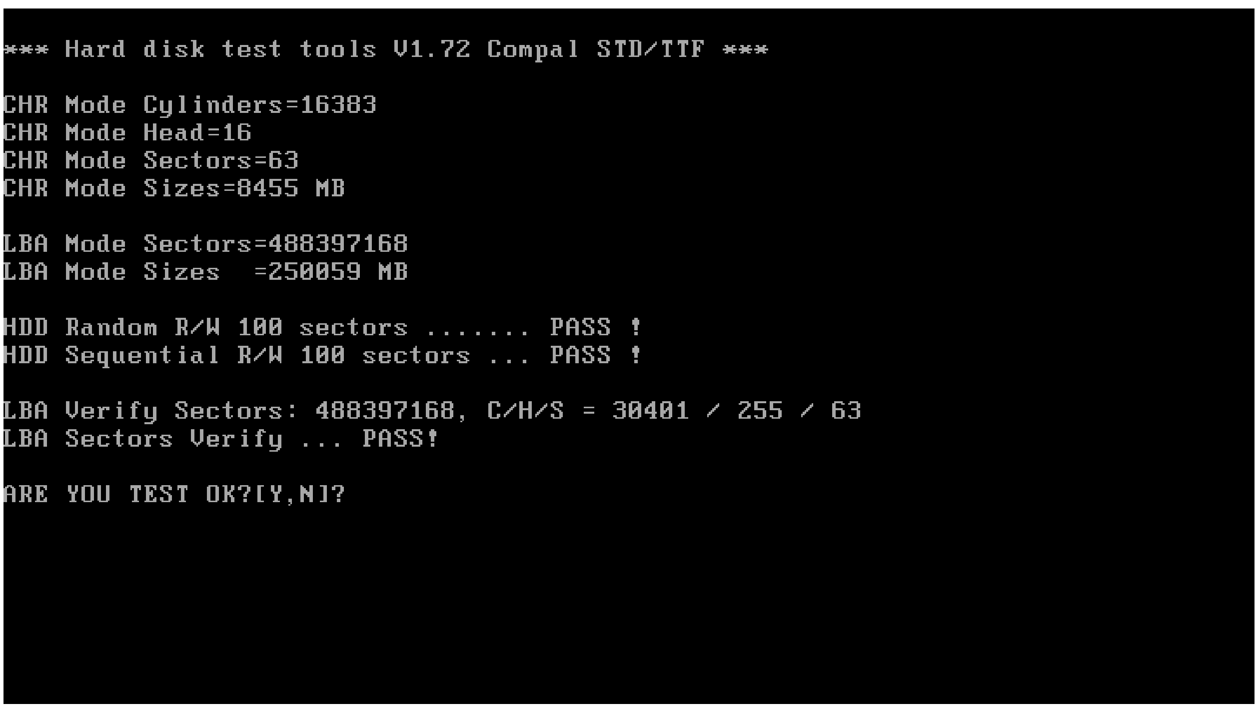


If input password is wrong, the screen would display as below:

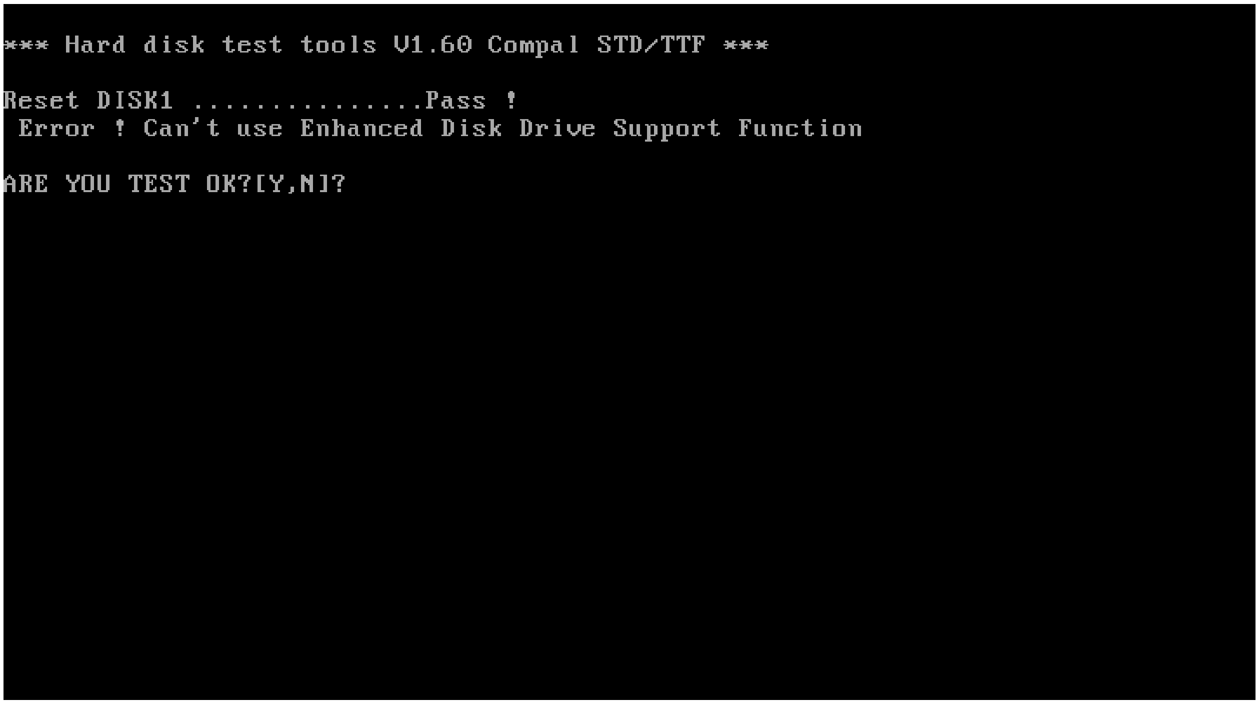


The screen will display as below picture to show the subtest is passed or failed when finished:

If it is show the picture as below, it means HDD function is OK

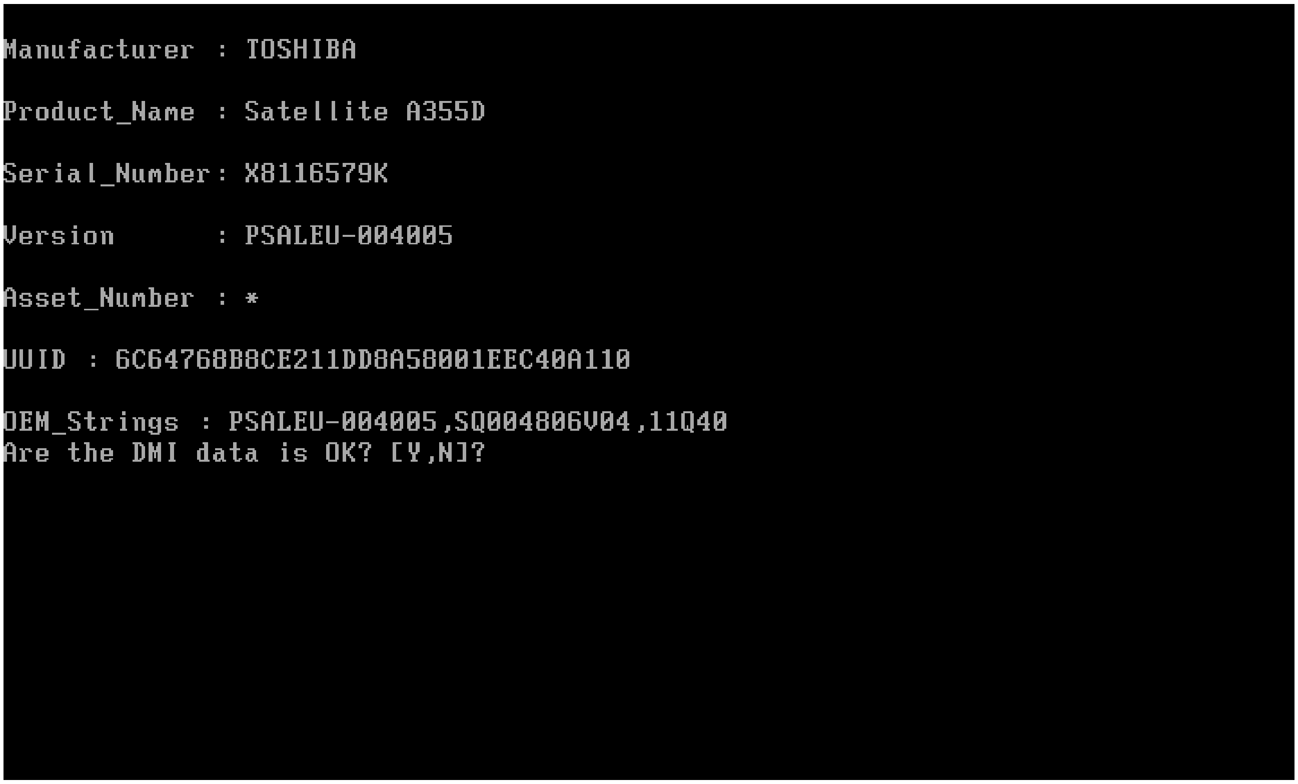


If the picture shows as below, it means he HDD function is NG



3.17 Read DMI

Compal write Toshiba Part No (version), Toshiba Serial No (Serial No), Product Name, OEM string and UUID, If you want to double check the DMI data, please select Read DMI item, the figure below will be displayed:



3.18 Write DMI

When you want to write DMI data, please select which data you want to write, the figure below will be displayed:

1. Write OME string
2. Write Version
3. Write Serial
4. Write Product
5. Back to test title



After write OK, you should reboot the system that can make the setting effective, or you can write next data before reboot system, the figure below will displayed:

```
please choice the item
 1: Write OEM String
 2: Write Version
 3: Write Serial
 4: Write Product
please enter the num you choose: 1
please enter the OEM String: psmadk-011002

Modify OEM String to psmadk-011002

Jump to EEPROM Bank : 0

Erase EEPROM Start Offset : a0 End Offset:dd Size:62
..............................................................
Jump to EEPROM Bank : 0

Flash EEPROM Start Offset : a0
..............
Confirm the data !
..............
Modify EM String success!

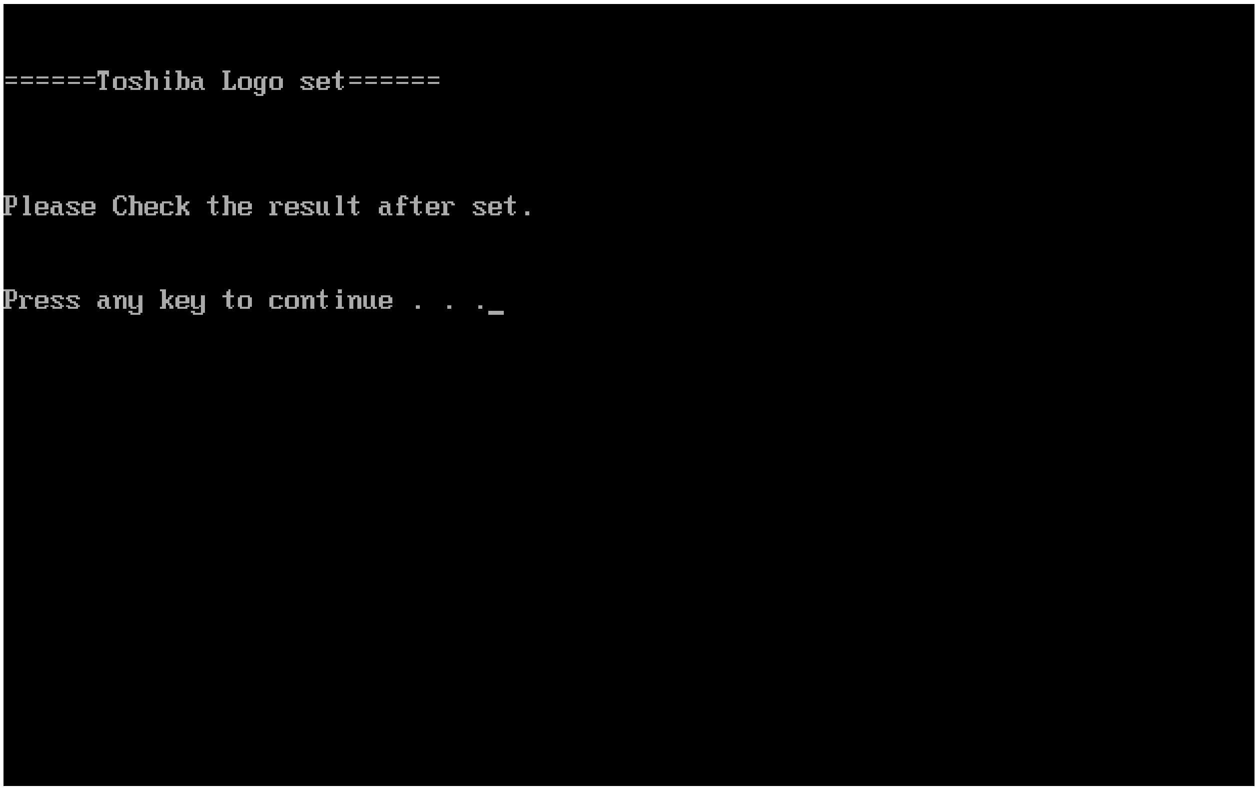
********Please reboot the system.To make the setting effective
**********Do you want to modify other dmi ? ****************
Press Y for Yes or N for No:
```

> ***NOTE**: should input correct DMI data, and should reboot the system that can make the setting effective.*

3.19 Toshiba Logo set

Set the computer’s Toshiba Logo for other region except Japan SKU.

The screen should display as below, indicating whether the test is passed or failed when finished.



Press any key continue to auto set, if write OK, the following message displays:



When Toshiba Logo set finish, please restart machine, when show below Logo:



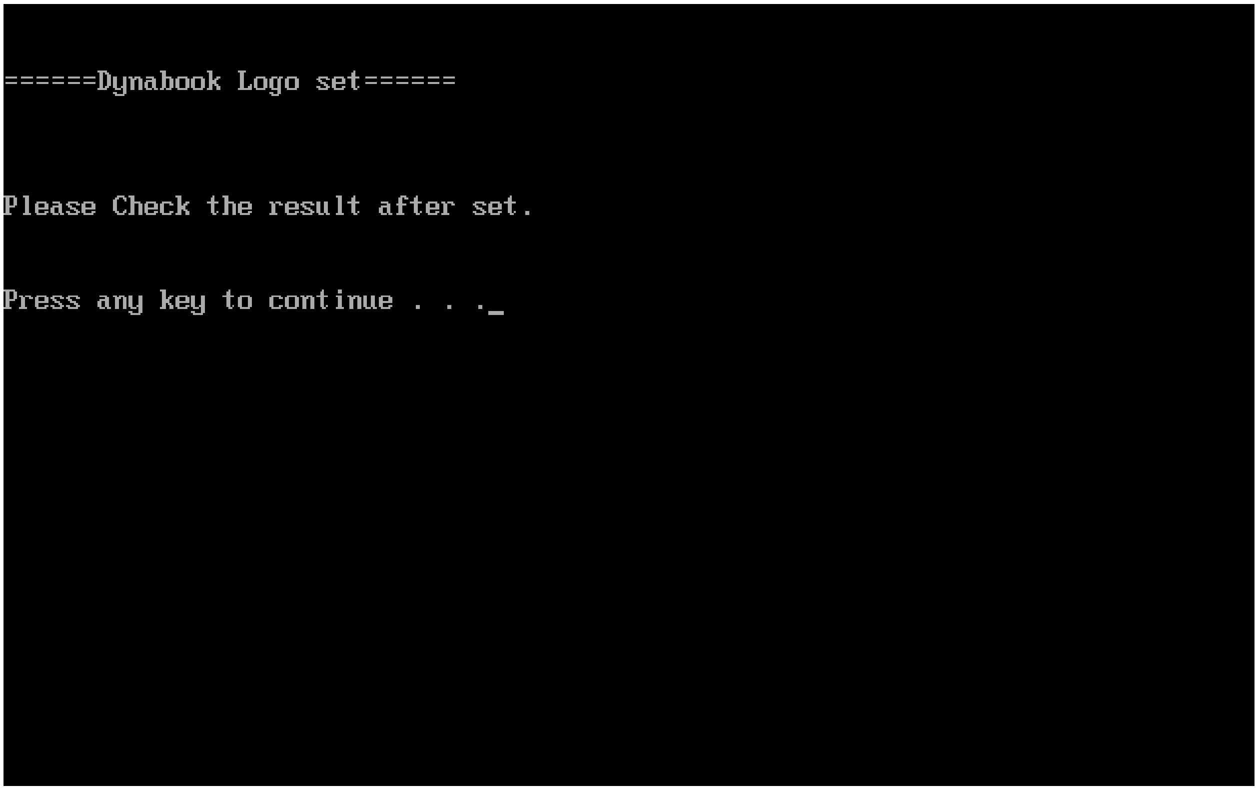
If an error is detected and a test fails, the following message displays:



3.20 Dynabook Logo set

Set the computer's Dynabook Logo for Japan SKU.

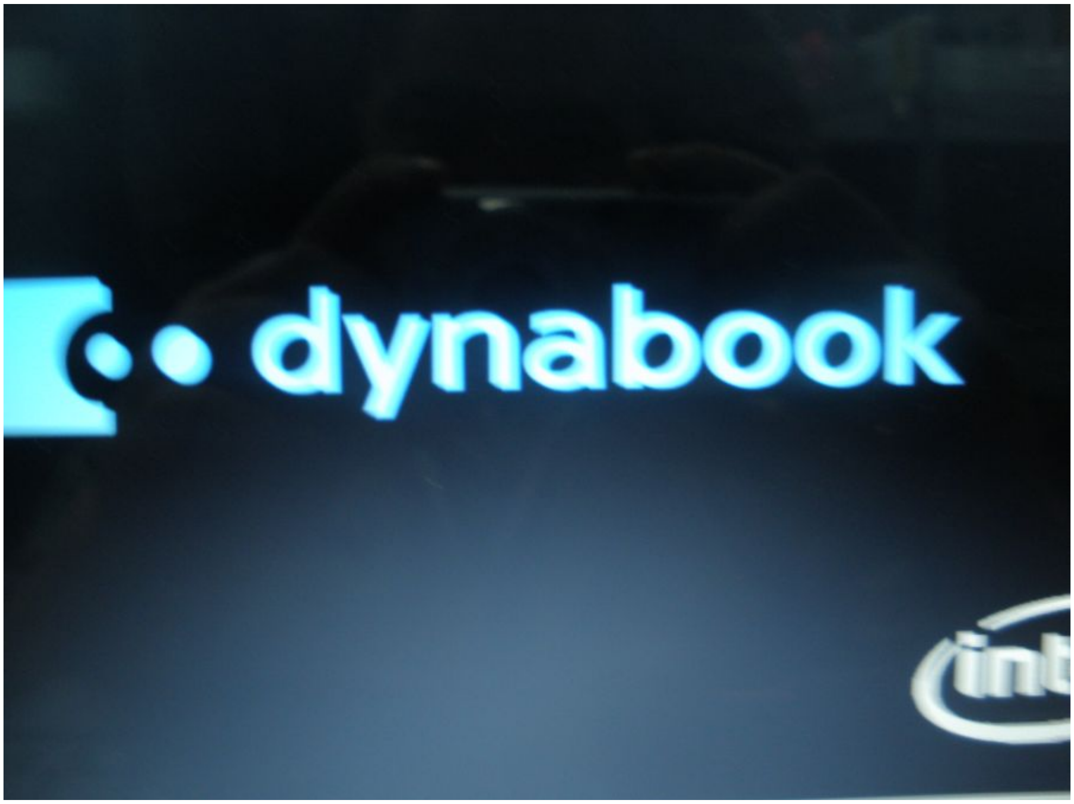
The screen should display as below, indicating whether the test is passed or failed when finished.



Press any key continue to auto set, if write OK, the following message displays:



When Dynabook Logo set finish, please restart machine, when show below Logo:



If an error is detected and a test fails, the following message displays:



3.21 TP TYPE R/W TEST

This T/P TYPE R/W test checks the computer's T/P TYPE and users write T/P vendor ID into EEPROM

The test runs automatically.

The screen should display as below, indicating whether the test is passed or failed when finished.

```
****************************************************************************
*  TP Check by EC JaFerLan V1.3 on 2009/02/12                               *
****************************************************************************
Synaptics TP
       0 uS: C 42
     300 uS: D 07Version 2.1 (support ALL model)
01
Write Ok

       0 uS: C 42
     300 uS: D 00
 2441400 uS: I E0(15)
 2484300 uS: I 2A(15)
 2526300 uS: I E0(15)
 2565000 uS: I 37(15)
 2604600 uS: I E0(15)
 2666700 uS: I B7(15)
 2704800 uS: I E0(15)
 2769000 uS: I AA(15)return code = 0
return code = 0

****************************************************************************
*  TP Check by EC JaFerLan V1.3 on 2009/02/12                               *
****************************************************************************
_
```

If write T/P type fail, the screen would display as below

```
=====TP R/W TEST=====
**************************************************************************
*  TP Check by EC JaFerLan V1.3 on 2009/02/12                              *
**************************************************************************
RETURN CODE: 0xFEECH0 is off
##########################
    TP TYPE Write FAIL
##########################
Press any key to continue . . ._
```

If read T/P type fail, the screen would display as below

```
=====TP R/W TEST=====
**************************************************************************
*  TP Check by EC JaFerLan V1.3 on 2009/02/12                              *
**************************************************************************
Synaptics TP
       0 uS: C 42
    1200 uS: D 07Version 2.1 (support ALL model)
01
Write Ok

       0 uS: C 42
     900 uS: D 00
**************************************************************************
*  TP Check by EC JaFerLan V1.3 on 2009/02/12                              *
**************************************************************************
RETURN CODE: 0xFEECH0 is off
#############################
    TP TYPE READ FAIL
#############################
Press any key to continue . . ._
```

If W/R T/P type passes, the screen would display as below

```
       0 uS: C 42
     900 uS: D 00
*************************************************************************
*  TP Check by EC JaFerLan V1.3 on 2009/02/12                              *
*************************************************************************
Synaptics TP
       0 uS: C 42
    2400 uS: D 07Version 2.1 (support ALL model)

 SET EE=☺

 SET EEEE=01
Version 2.1 (support ALL model)

 SET EE=☺

 SET EEEE=01
Version 2.1 (support ALL model)

 SET EE=☺

 SET EEEE=01
Version 2.1 (support ALL model)
_
```



3.22 EEPROM Setting

This EE-PROM SETTING will set the computer's function status into EEPROM, included supported function and no support function.

> ***NOTE**: Should perform EE-PROM SETTING once change M/B. It defined as normal rule.*

The screen should display as below:

```
Please select Check or Disable Function

1. Set MIC Function Status in EE-PROM (Disable/Enable)
2. Set HDMI Function Status in EE-PROM (Disable/Enable)
3. Set Language Function Status in EE-PROM (Disable/Enable)
4. Set 3G Function Status in EE-PROM (Disable/Enable)
5. Set Wimax Function Status in EE-PROM (Disable/Enable)
6. Set NON_OS function flag in EE-PROM (NONEOS/HAVEOS)
7. Set No Support Function Disable
8. Set and check SKUID status (Set/Check)
9. Back To Test Title


[1,2,3,4,5,6,7,8,9]?_
```

If press "1" to set MIC function status in EE-PROM, the screen should display as below:

```
Please select Check or Disable Function

1. Set MIC Function Status in EE-PROM (Disable/Enable)
2. Set HDMI Function Status in EE-PROM (Disable/Enable)
3. Set Language Function Status in EE-PROM (Disable/Enable)
4. Set 3G Function Status in EE-PROM (Disable/Enable)
5. Set Wimax Function Status in EE-PROM (Disable/Enable)
6. Set NON_OS function flag in EE-PROM (NONEOS/HAVEOS)
7. Set No Support Function Disable
8. Set and check SKUID status (Set/Check)
9. Back To Test Title

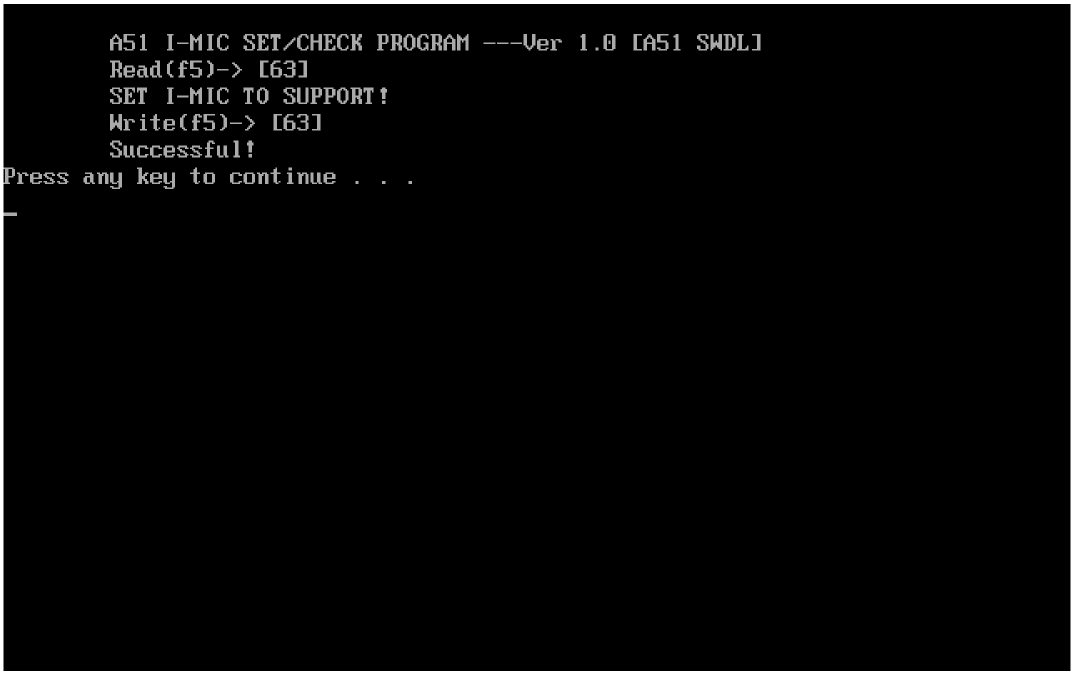

[1,2,3,4,5,6,7,8,9]?1


1. Please check SPEC of this unit whether has MIC? (Y=MIC, N=NOMIC)

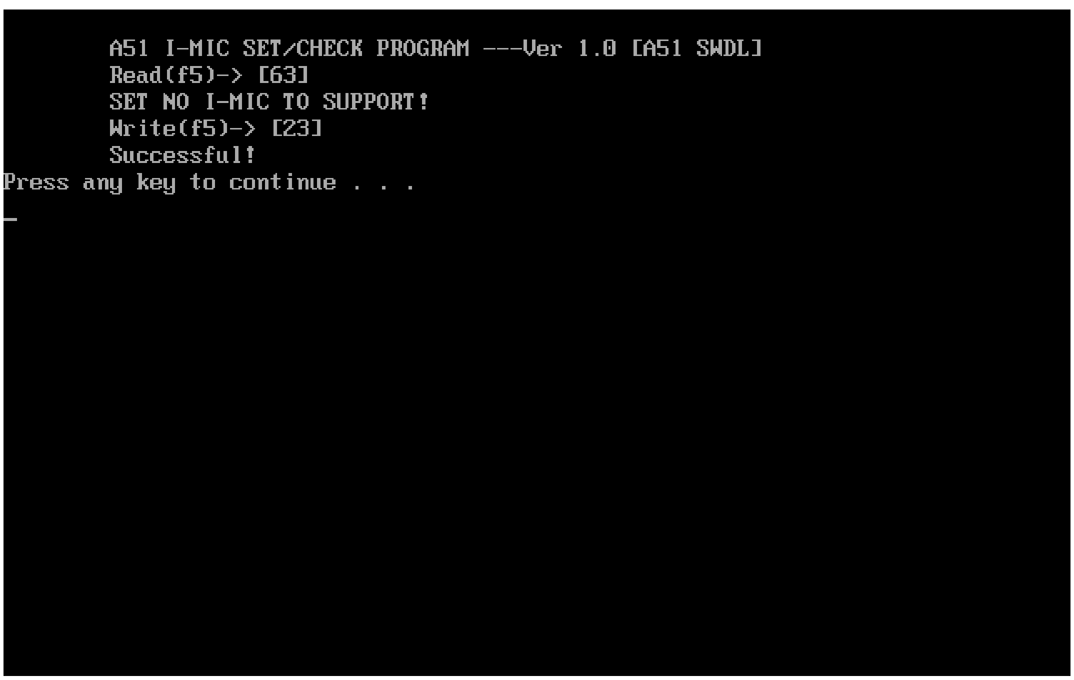

[Y,N]?_
```

Please check related information to judge this unit whether has MIC function.

If this unit has MIC function, press “Y” then program will set MIC enable automatically as below:



If this unit has no MIC function, press “N” then program will set MIC disable automatically as below:



Then press any key go back to EE-PROM SETTING option as below:

```
Please select Check or Disable Function

1. Set MIC Function Status in EE-PROM (Disable/Enable)
2. Set HDMI Function Status in EE-PROM (Disable/Enable)
3. Set Language Function Status in EE-PROM (Disable/Enable)
4. Set 3G Function Status in EE-PROM (Disable/Enable)
5. Set Wimax Function Status in EE-PROM (Disable/Enable)
6. Set NON_OS function flag in EE-PROM (NONEOS/HAVEOS)
7. Set No Support Function Disable
8. Set and check SKUID status (Set/Check)
9. Back To Test Title


[1,2,3,4,5,6,7,8,9]?_
```

If press “7” to disable all no support function, program will perform automatically as below:

```
A51 SPEAKER EQ VALUE SET/CHECK PROGRAM V1.1 [A51 SWDL]
Read(ef)-> [fc]
SET Nonbrand speakers EQ!
Write(ef)-> [fc]
Successful!
```

```
A51 Display SET/CHECK PROGRAM ---Ver 1.0 [A51 SWDL]
Read(f5)-> [df]
SET NO Display TO SUPPORT!
Write(f5)-> [df]
Successful!
```

```
Front Edge Logo LED Setting program V1.0 [A51 SWDL]
Read(f5)-> [63]
Disable LOGO LED Funtion!
Write(f5)-> [63]
Successful!
```

```
A51 Felica EQ VALUE SET/CHECK PROGRAM V1.2 [A51 SWDL]
Read(f2)-> [08]
SET Felica NOT Exist EQ!
Write(f2)-> [08]
Successful!
```

```
A51 K/B LED EQ VALUE SET/CHECK PROGRAM V1.0 [A51 SWDL]
Read(e2)-> [fe]
SET K/B LED Disable EQ!
Write(e2)-> [fe]
Successful!
```

```
A51 UWB EQ VALUE SET/CHECK PROGRAM V1.1 [A51 SWDL]
Read(f2)-> [08]
SET UWB NOT Exist EQ!
Write(f2)-> [08]
Successful!
```

```
Set No Support Function All Disable OK
Press any key to continue . . .
_
```

Then press any key to go back to EE-PROM SETTING option as below:

```
Please select Check or Disable Function

1. Set MIC Function Status in EE-PROM (Disable/Enable)
2. Set HDMI Function Status in EE-PROM (Disable/Enable)
3. Set Language Function Status in EE-PROM (Disable/Enable)
4. Set 3G Function Status in EE-PROM (Disable/Enable)
5. Set Wimax Function Status in EE-PROM (Disable/Enable)
6. Set NON_OS function flag in EE-PROM (NONEOS/HAVEOS)
7. Set No Support Function Disable
8. Set and check SKUID status (Set/Check)
9. Back To Test Title


[1,2,3,4,5,6,7,8,9]?_
```

If press "9" program will go back to test title as below:

Buffalo 10A/10B/10C/10BL Function T&D DISKETTE MENU		
A.CONFIG CHECK TEST	J.Magnetic Switch	S.TP TYPE R/W TEST
B.AUDIO sound TEST	K.LAN TEST	T.EEPROM setting
C.FAN ON/OFF TEST	L.RTC TEST	
D.MAIN BATTERY TEST	M.3D G-sensor test	
E.FDD TEST	N.1st HDD TEST	
F.Memory check	O.Read DMI	
G.KEYBOARD TEST	P.Write DMI	
H.MOUSE (PAD) TEST	Q.Toshiba Logo set	Z.Save LOG to USB
I.LCD PIXELS TEST	R.Dynabook Logo set	X.EXIT
KAVAA/KAVAE/NAVAA/PAV10 T&D Function test --Ver:1.3(2010.4.11)		

Please select a test item _

Chapter 4

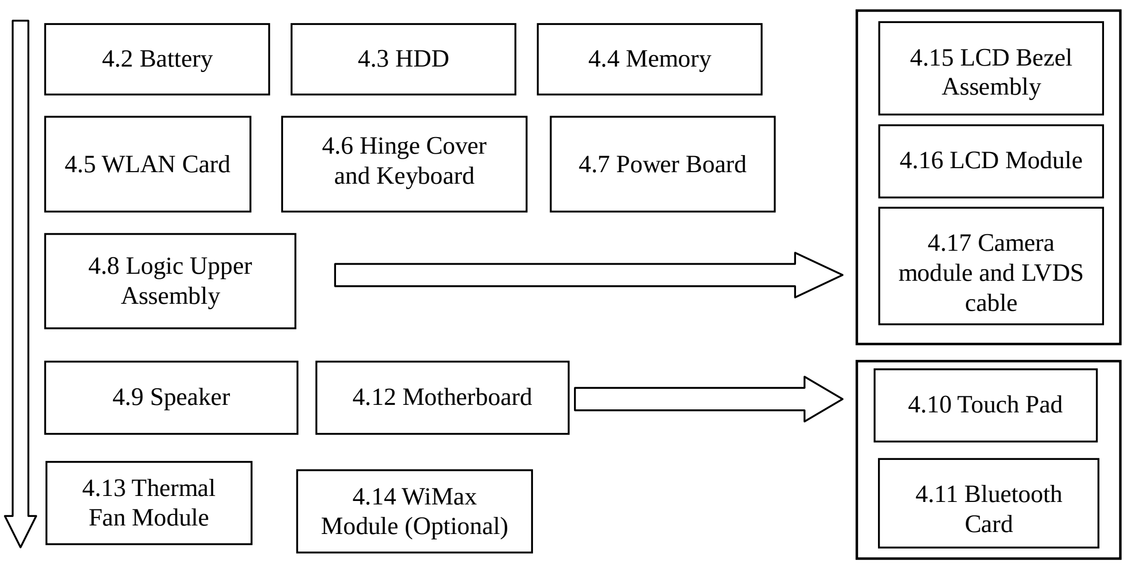
Replacement Procedures

Chapter 4 Contents

Figures

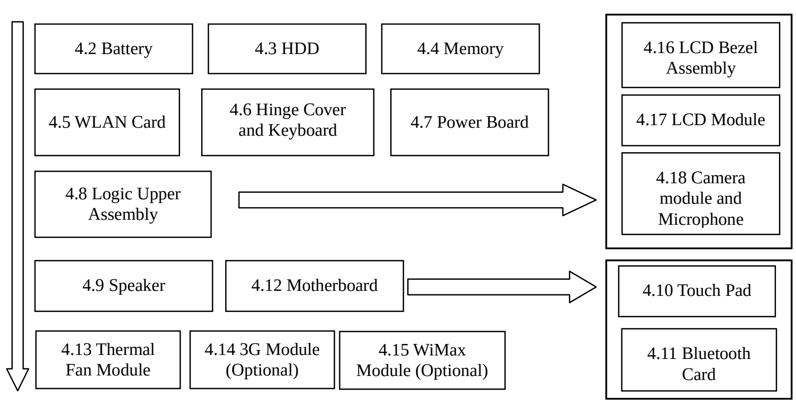
4.1 General

This chapter explains how to disassemble the laptop and replace Field Replaceable Units (FRUs). Some replacement procedures may not require you to remove all the surrounding FRUs to replace only one FRU. The chart below shows the FRUs in the order in which they should be removed in a top-down manner, irrespective of their physical locations. The FRUs shown in the top area of the chart should normally be removed before removing the FRUs shown in the bottom area. To replace the FRUs, first identify the suspect FRU for the system failure. Next, according to this chart, determine the FRUs that need to be removed before removing the suspect FRU. After you determine those FRUs, go to the appropriate sections according to the section numbers shown in the boxes. Then start removal and replacement.



How to use the chart (two examples):

- For removing the Motherboard:
  First, remove parts from 4.6 Hinge Cover & Keyboard, 4.7 Power Board and 4.8 Logic Upper Assembly
- For removing the LCD Module:
  First, remove Logic Upper Assembly, then remove the LCD Bezel Assembly.



Safety Precautions

Before you begin disassembly read the following safety precautions carefully. Be sure to follow them while you are working.

DANGER:

1. *Always use the original batteries or replacement batteries authorized by Toshiba. Batteries other than those differ in specifications and are incompatible with the laptop. They may burst or explode. To avoid leakage of alkaline solutions, never heat or disassemble the battery packs. Never throw the battery packs into a fire. If this is violated, they will explode.*
2. *The components such as the power supply and inverter carry high voltages. When you partially disassemble the laptop and turn on the components, use extreme care not to touch the connectors and components to avoid the risk of electrical shock. Do not disassemble individual components during first-level maintenance.*

WARNING:

1. *To avoid the risk of electrical shock, turn the laptop off and remove the AC adapter from the electrical outlet.*
2. *Because the battery in the laptop is left charged, the risk of electrical shock remains even after the AC adapter is removed from the electrical outlet. To avoid the risk of electrical shock, be sure to remove any metal jewelry or accessories such as necklaces, bracelets, and rings before starting work. Never work with damp or wet hands.*
3. *To avoid personal injury, use care to avoid the sharp edges or corners of the components.*

CAUTION:

1. *Before replacing a component, make sure that the replacement component meets the required specifications. To avoid laptop failures, never use components that do not meet the specifications.*
2. *To avoid internal damage such as short circuits and fire, never drop metal objects such as screws, pins, paper clips, etc. into the components. When a screw is removed, be sure to replace a screw that is the same size as the original screw. Make sure that all the screws are fastened securely. Loose screws can cause short circuits, overheating, smoke, or fire.*
3. *Before removing a FRU or other component, make sure that all the component cables have been disconnected to avoid the risk of electrical shock caused by accidental contact with the energized components.*
4. *For AC input, be sure to use the AC adapter and AC power cable that come with your laptop or Toshiba-recommended equivalents.*
5. *To avoid the risk of electrical shock, make sure that all the replacement components meet the specifications of the laptop and that all the cables and connectors are fastened securely.*
6. *Inside the PC are components that become hot during operation (such as the CPU and cooling module). To avoid burns, let the hot components cool down before starting inspection or repair task.*

Before You Begin

Before you begin to disassemble the laptop, keep in mind the precautions and advice in this section. Always begin disassembly by removing the AC adapter and battery pack. Remove the optional parts and accessories as well. The procedures for removing the batteries will be explained later.

Disassemble the laptop only when an abnormality has occurred.

Use only the recommended tools.

To run and store the laptop, be sure to prepare a working environment that is free from:

- ❑ Dust and contaminants
- ❑ Static electricity
- ❑ Extremely high or low temperatures and extremely high humidity

Run the diagnostic tests explained in Chapter 2 of this manual to identify the FRU that has probably caused the system failure.

Perform only the required machine operations. Use only the disassembly and reinstallation procedures described in this manual.

Place the removed components in a safe place away from the laptop so that they are not damaged or get in the way of you doing your work.

Normally, a number of screws need to be removed or replaced during disassembling. Place the removed screws in a safe place so that you can easily find the right screws for the right components.

When assembling the laptop, use the specified screws to fasten the parts to the specified locations. See the appropriate explanations and figures for screw sizes.

To avoid personal injury, use care to handle components that have sharp edges or corners.

After you have replaced a FRU, check that the FRU works correctly to ensure normal laptop operation.

Disassembly Procedures

The cable connectors come in these two basic types:

- Pressure plate connectors
- Normal pin connectors

To remove a pressure plate connector, pull up the tabs on either side of the connector's plastic pressure plate and gently pull the cable out of the connector. To reconnect the cable to the pressure plate's connector, raise the pressure plate up to a satisfactory height and slide the cable into the connector. Secure the cable in the correct position by pressing down the sides of the pressure plate so that the plate is flush with the sides of the connector. Grasp and pull the cable gently to check that the cable is connected firmly. If the cable came off the connector, reinsert the cable by raising the pressure plate up to a satisfactory height.

Normal pin connectors are used for all the other types of cables. These connectors can be installed or removed by simply inserting them or pulling them out.

Assembly Procedures

You have to reassemble the laptop after you have disassembled the laptop and fixed the component that caused the problem.

When reassembling the laptop, keep the following general guidelines in mind:

- Take your time to carry out the suggested instructions completely. Hurried reassembly can often cause problems.
- Check that all the cable and connectors are fastened securely.
- Before securing the FRUs or other parts, check that the cables are not caught by the screws or FRUs.
- Check that all the latches are closed securely.
- Check that all the required screws are used to secure the FRUs. Using wrong screws can damage the threads or heads of the screws or does not ensure that the FRUs are secure.

After installing a FRU, make sure that the FRU and laptop work normally.

Tools and Equipment

For your safety and that of other people in the working environment, it is strongly recommended that you use electrostatic discharge (ESD) equipment. The proper use of this equipment will ensure successful repair work and reduce the costs for repairing damaged components. The equipment and tools required for disassembly and reassembly are:

- One 2 mm Phillips screwdriver
- One 4 mm flat-blade screwdriver
- Torx screwdriver with type T6 bit.
- Tweezers (for pulling out screws)
- ESD mats (for the floor and work desks)
- An ESD wrist strap or heel grounder
- Anti-static carpets or flooring
- Air ionizers (for highly electrostatic sensitive areas)
- A plastic card (in credit card size)

Screw Tightening Torque

To secure screws, follow the torque values listed below. Over tightening can damage components and screws. Under tightening can loosen the screw or cause screws to come off, which may result in short circuits or other damage.

M2 (2 mm)	0.15~0.20 N･m (1.5~2.0 kgf･cm)
M2.5 (2.5 mm)	0.26~0.30 N･m (2.5~3.0 kgf･cm)
M3 (3 mm)	0.26~0.30 N･m (2.5~3.0 kgf･cm)
M2.5x4 screws	0.26~0.30 N･m (2.5~3.0 kgf･cm)
M2.5x6 screws	0.26~0.30 N･m (2.5~3.0 kgf･cm)

Colors of Screw Shanks

For easy identification of the correct screws, the screw shanks are colored according to their lengths, as follows:

- Screws of an odd-numbered length Blue
- Screws of a special length Black
  (Screws of a special length are those of a length having decimal places, eg - 2.5 mm).

Symbols of Screws on the Laptop Body

For easy maintenance, the screw types are shown on the laptop body as symbols. A symbol consists of a letter representing the screw type and a numeral representing the screw length.

- Screw type Letter
- Bind screw B (stands for bind)
- Flat-head screw F (stands for flat-head)
- Super flat-head screw S (stands for super flat-head)
- Tapping screw T (stands for tapping)
- Other screws U (stands for unique-pan head screws, studs, etc.)

Symbol examples

- 6 mm bind screw B6
- 12 mm bind screw B12
- 5 mm stud U5
  (The numeral represents the rounded length of the threaded portion regardless of the entire stud length.)

4.2 Battery

Removing the Battery Pack

Remove the battery pack according to the following procedures and Figure 4.1.

> ***CAUTION:*** *When handling the battery packs, use care not to short circuit the terminals. Do not drop, hit, twist, or bend the battery packs. Do not scratch or break up their casing.*

1. Turn the laptop upside down so that the bottom is facing you.
2. Slide the battery safety lock to the unlock position.
3. Slide the battery release latch and remove the battery pack from the laptop as shown in Figure 4.1.

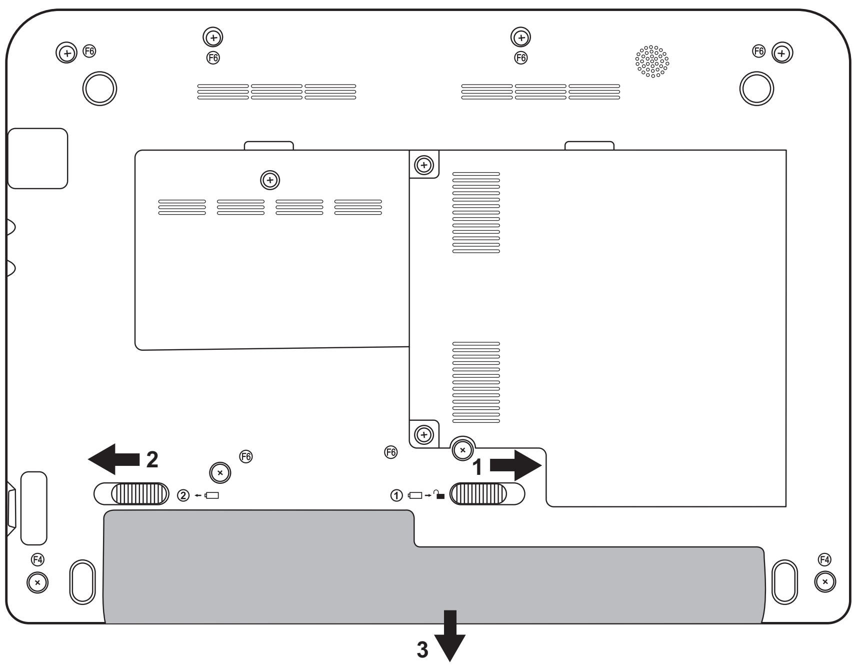


Figure 4.1 Removing the Battery Pack

> ***NOTE:*** *Dispose of the used battery packs as required by local ordinances or regulations.*

Installing the Battery Pack

Install the battery pack according to the following procedures.

> ***CAUTION:*** *The battery packs contain a lithium ion battery, which can explode due to improper replacement, use, handling, or disposal. Always dispose of the battery packs as required by local ordinances or regulations. Use only replacement batteries recommended by Toshiba.*

> ***NOTE:*** *Visually check the battery's terminals. If they are dirty, clean them with a dry cloth.*

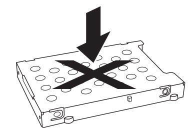
1. Gently insert a new or recharged battery pack into place. Check that the battery release latch slides in and stops with a click.

2. Slide in the battery safety lock to the lock position.

4.3 HDD

Removing the HDD

CAUTION: *Do not press on the top or bottom of the drive. Applying such pressure can either corrupt the data in the drive or damage the drive.*



Remove the HDD (hard disk drive) according to the following procedures and Figure 4.2, 4.3 and 4.4.

1. To remove the HDD, remove two M2.5x4 HDD door TORX screws that secure the HDD door and then remove the HDD door as shown in Figure 4.2.

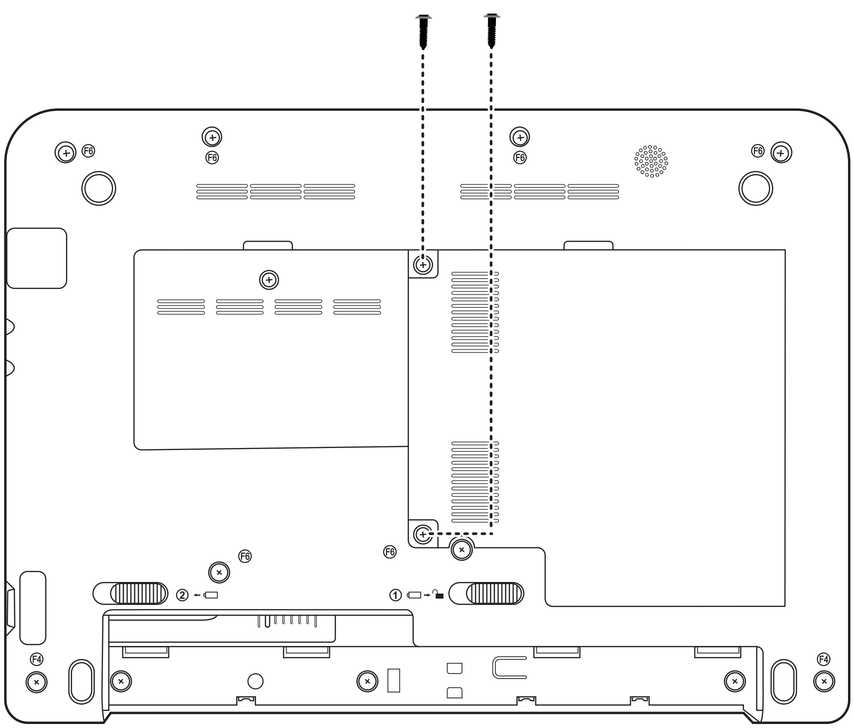


Figure 4.2 Removing the HDD door

2. Slide the HDD pack horizontally to disconnect it from HDD connector.
3. Lift up and remove the HDD pack from HDD bay as shown in Figure 4.3.

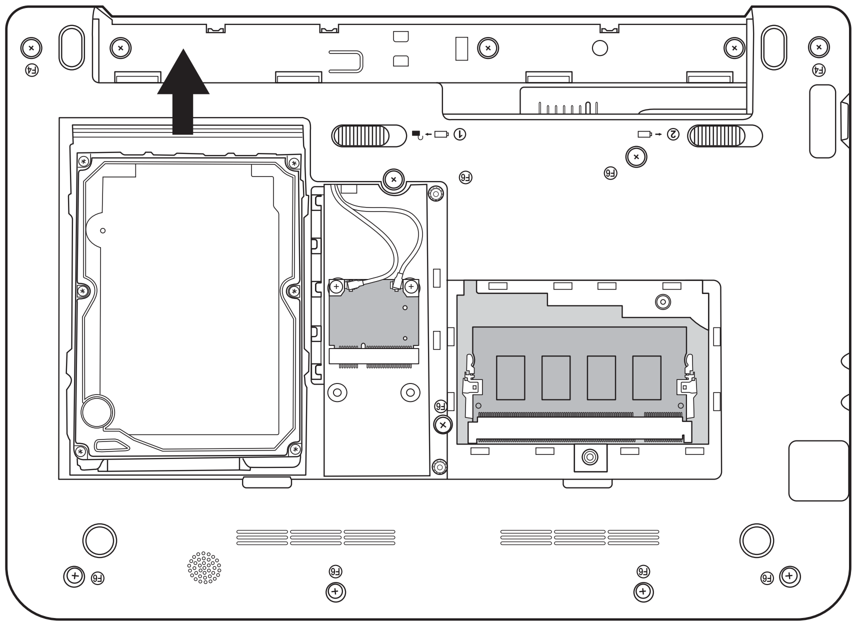


Figure 4.3 Removing the HDD from the HDD bay

> ***NOTE:*** *Do not disassemble the HDD pack when it is working normally. Disassemble or replace the HDD pack only if it fails.*

4. Place the HDD pack on a flat surface such as a desk.

5. To separate the plate from the HDD, remove four M3x3 screws as shown in Figure 4.4.

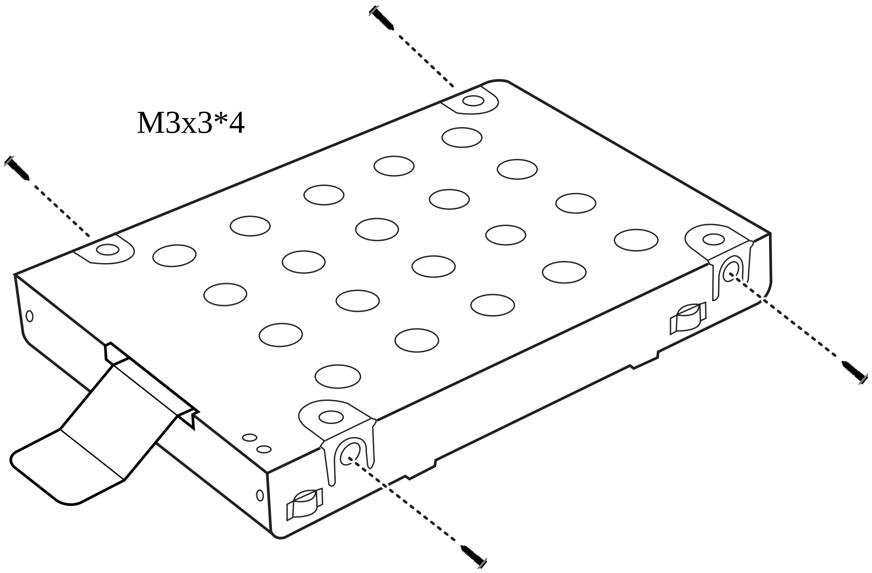


Figure 4.4 Removing the HDD plate

CAUTION: *Do not apply pressure to the top or bottom of the drive.*

Installing the HDD

Install the HDD according to the following procedures.

CAUTION: *To avoid damage, always hold the HDD only by its sides.*

1. Place the HDD into the HDD plate.

2. Secure the HDD and its plate with four M3x3 screws.

CAUTION: *To prevent the HDD plate from being distorted when installing the HDD pack into the laptop, do not press the center of the HDD pack. Always hold the HDD pack by its sides.*

3. Install the HDD pack into the correct position in the laptop. Connect the HDD pack to the laptop.

4. Secure the main HDD door by tightening two M2.5x4 TORX screws.

4.4 Memory

Removing the Optional Memory

Remove the optional memory according to the following procedures and Figure 4.5 and 4.6 after checking that the laptop is turned off.

> ***CAUTION:*** *Remove the optional memory after turning off the laptop. If this is violated, the laptop or memory can be damaged.*

1. Turn the laptop upside down.
2. Remove one M2.5Dx4 screw that secures the RAM door.
3. Remove the RAM door as shown in Figure 4.5.

> ***CAUTION:*** *Do not touch the connectors on the memory or in the laptop. Contaminated connectors can cause memory access problems.*

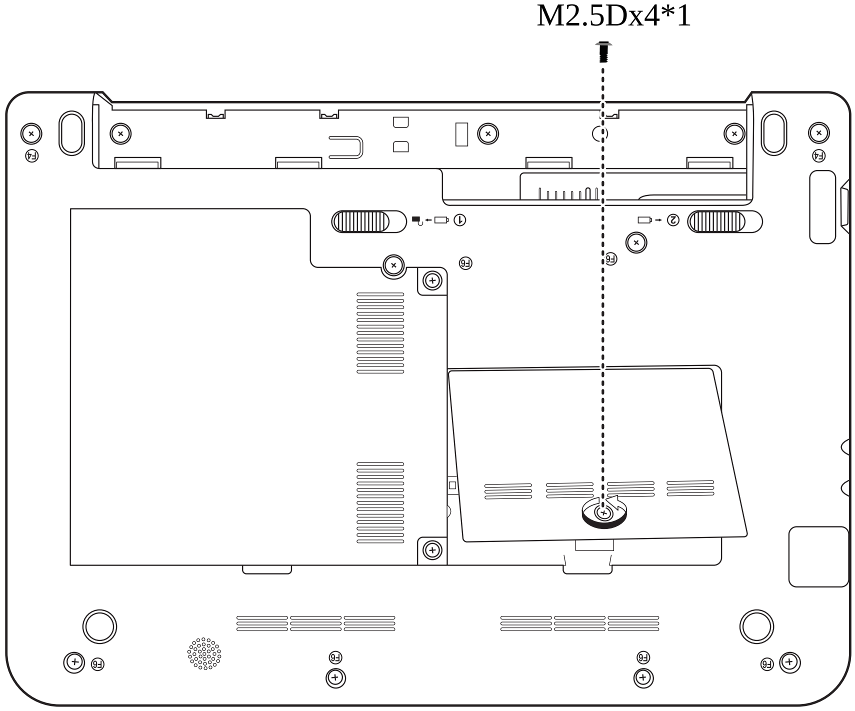


Figure 4.5 Removing the RAM door

4. Spread out the two memory lock latches so that the memory pops up. Please follow the procedure as shown in Figure 4.6.

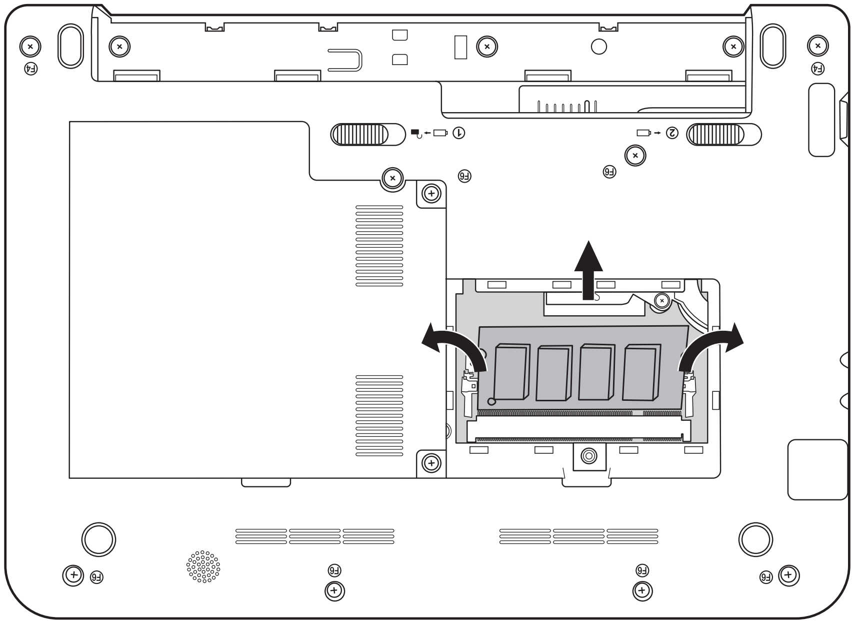


Figure 4.6 Removing the RAM from the laptop

5. Pull the memory up and out at an angle, using care to avoid touching the connectors.

Installing the Optional Memory

Install the optional memory according to the following procedures after checking that the laptop is turned off.

> ***CAUTION:*** *Install the optional memory after turning off the laptop. If this is violated, the laptop or memory can be damaged.*

1. Insert the memory into the connector at an angle of about 30 degrees.
2. Press down on the memory module so that it is secured with both memory lock latches.
3. Reinstall the optional RAM door.
4. Secure the RAM door with one M2.5Dx4 screw.

After the laptop is turned on, check the hardware configuration in the Hardware Setup or TESTUP program to make sure that the installed memory has been recognized by the system. If it has not been recognized yet, check the connections.

4.5 WLAN Card

Removing the WLAN Card

Remove the WLAN card according to the following procedures and Figure 4.7.

1. Detach the two antennas on the WLAN card.
2. Remove two M2x3 screws that secure the WLAN card as shown in Figure 4.7.
3. Pull the WLAN card out at an angle.

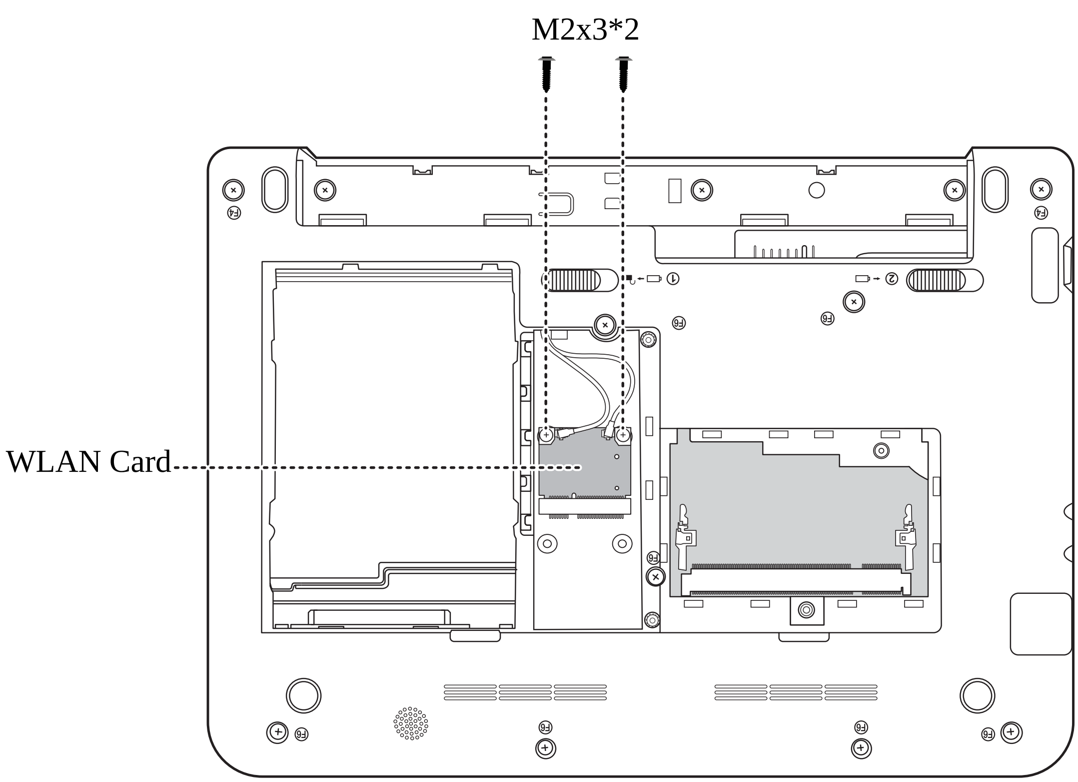


Figure 4.7 Removing the WLAN card

Installing the WLAN Card

Install the WLAN card according to the following procedures.

1. Insert the WLAN card into the connector.
2. Press the card down and secure it with two M2x3 screws.
3. Attach the two antennas to the WLAN card. The white (MAIN) antenna to the #1 connector and the black (AUX) antenna to the #2 connector.

4.6 Hinge Cover and Keyboard

Remove the Hinge Cover and Keyboard according to the following procedures and Figure 4.8, 4.9 and 4.10.

1. Remove the following twelve screws as shown in Figure 4.8:
   - seven M2.5x6 screws
   - five M2.5x4 screws
2. Detach any WLAN and modem antennas from their respective cards.

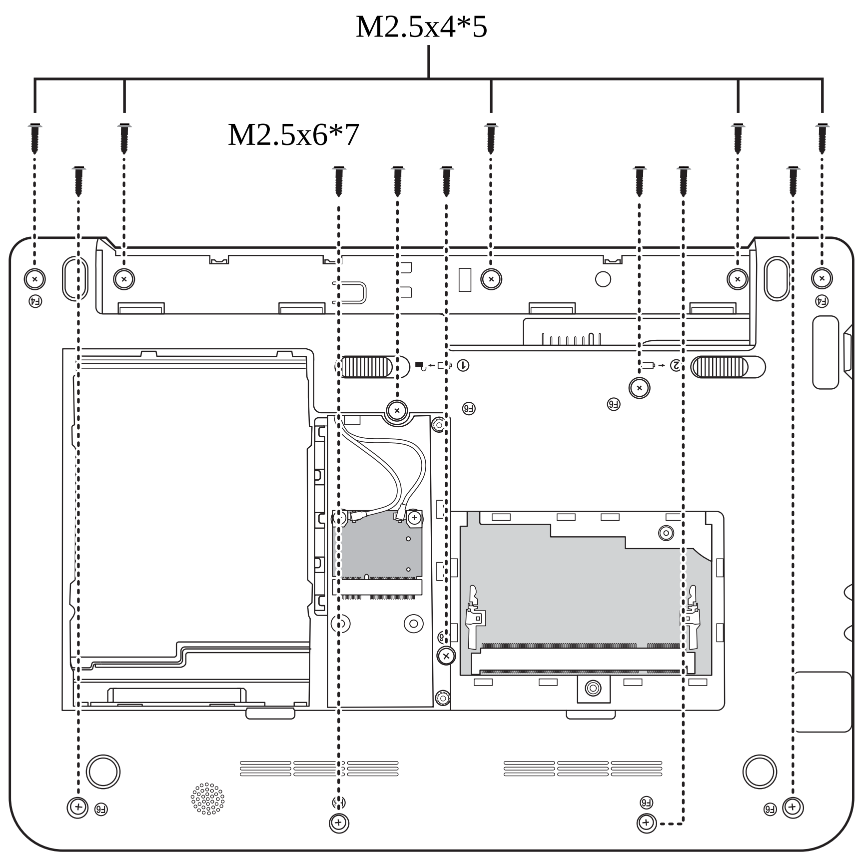


Figure 4.8 Removing the screws from the bottom of the laptop

Removing the Hinge Cover

Remove the hinge cover according to the following procedures.

1. Use your fingers to unclasp three hinge cap hooks as indicated in Figure 4.9.

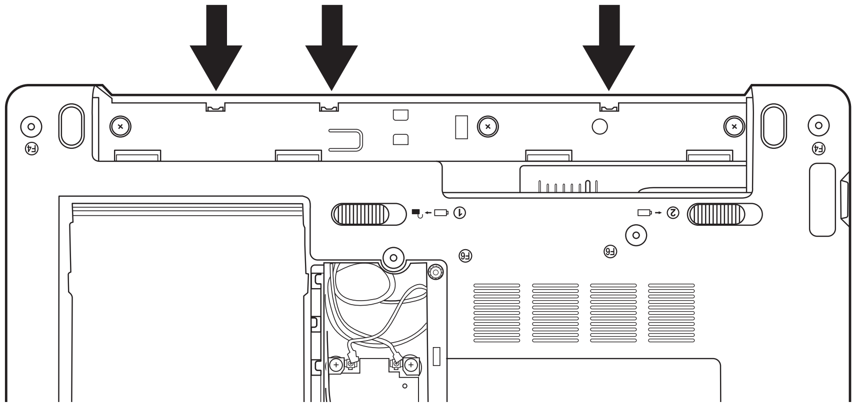


Figure 4.9 Detaching three hinge cap hooks

2. Turn the laptop upright and open the LCD cover to the maximum angle.
3. Push the hinge cover toward the battery bay with an outward rolling motion until the hinge cover tabs are released from the system and the hinge cover comes loose as shown in figure 4.10.
4. Remove the hinge cover from the system.

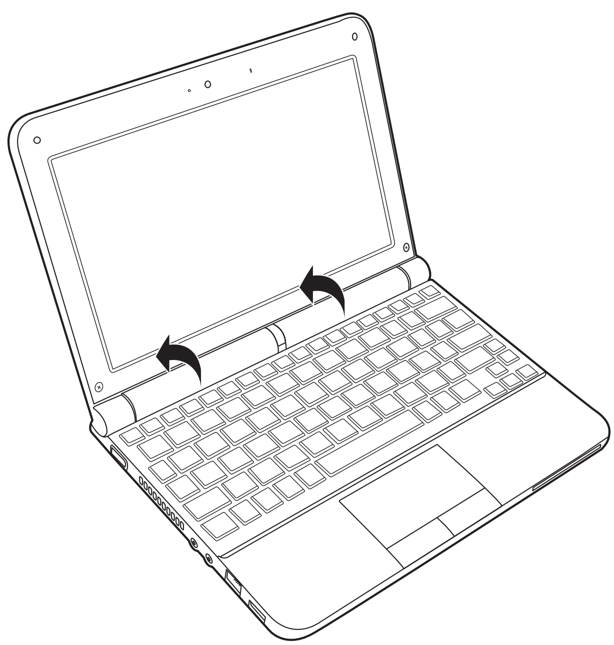


Figure 4.10 Removing the Hinge Cover

Removing the Keyboard

Remove the Keyboard according to the following procedures and Figure 4.11.

1. Open the laptop.
2. Unfasten the four hooks on the sides of the logic upper assembly. Lift up the keyboard and remove the cable connecting it to the motherboard.

> ***NOTE:*** *Hooks fastening flat-type keyboards will be located on the logic upper assembly rather than the keyboard itself.*

3. Remove the keyboard.

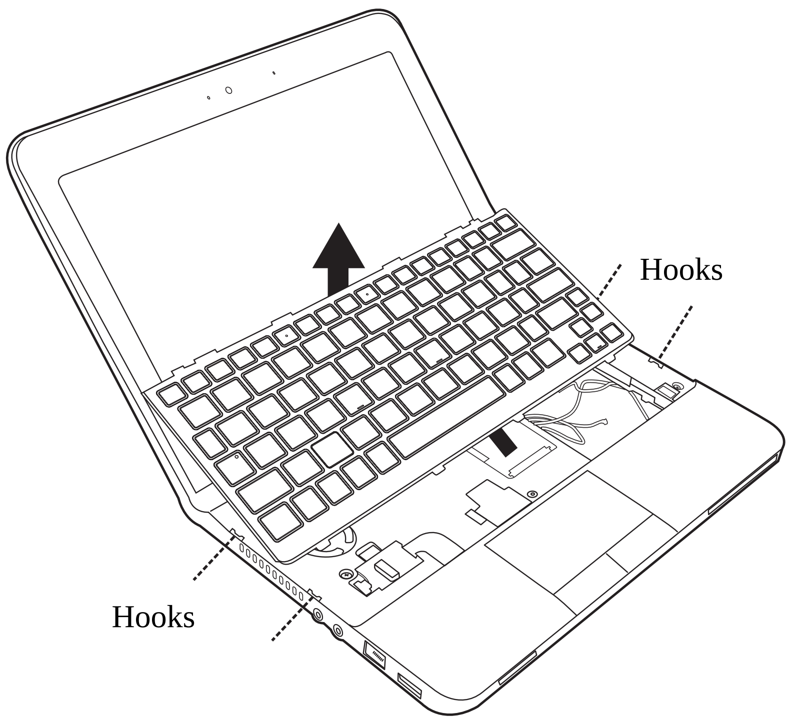


Figure 4.11 Removing the keyboard

Installing the Hinge Cover and Keyboard

Install the hinge cover and keyboard according to the following procedures.

1. Attach the cable from the underside of the keyboard to the connector on the logic upper assembly.

2. Seat the keyboard in its correct position making sure the four hooks on either side are fastened.

3. Seat the hinge cover in the correct position and firmly click into place.

4. Close the laptop.

5. Turn the laptop upside down. Make sure all three hinge cap hooks are firmly in place.

6. Secure the laptop with twelve screws as indicated in Figure 4.8:

   – seven M2.5x6 screws

   – five M2.5x4 screws

7. Fasten any WLAN or modem antennas to their respective connectors.

4.7 Power Board

Removing the Power Board

Remove the power board according to the following procedures and Figure 4.12.

1. Use tweezers to release the latches on the left and right sides of the connector by pushing in the direction of the arrows in Figure 4.12.
2. Remove the power board cable from the motherboard.
3. Press down the latch that protrudes to the power board on its right side. Push the power board in the direction indicated in figure 4.12 and slide the power board out.
4. Remove the power board from the logic upper assembly.

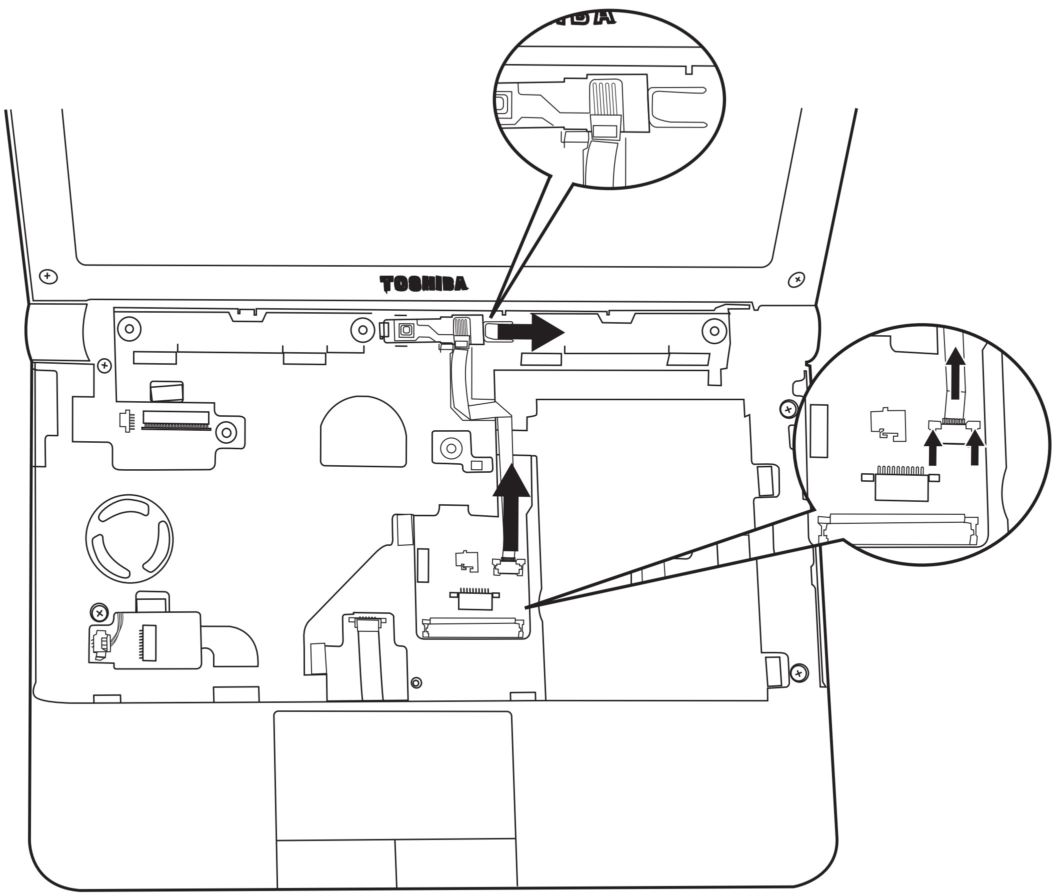


Figure 4.12 Removing the Power Board

> ***Note:*** *Be careful not to damage the Power Board when connecting it with the cable. Make sure the card is seated in the correct position.*

Installing the Power Board

Install the power board according to the following procedures.

1. Seat the power board in the correct position on the logic upper assembly.

2. Slide the power board to the end of the track until the latch clicks into place.

3. Place the power board cable into the connector on the motherboard.

4. Use tweezers and a finger to push down on the left and right latches of the connector. Both latches must be pushed simultaneously to secure the power board cable.

5. Secure the power board cable with adhesive tape.

4.8 Logic Upper Assembly

Removing the Logic Upper Assembly

Remove the logic upper assembly according to the following procedures and Figure 4.13, 4.14, 4.15, 4.16 and 4.17.

1. Remove four 2.5x6 screws from the logic upper assembly.

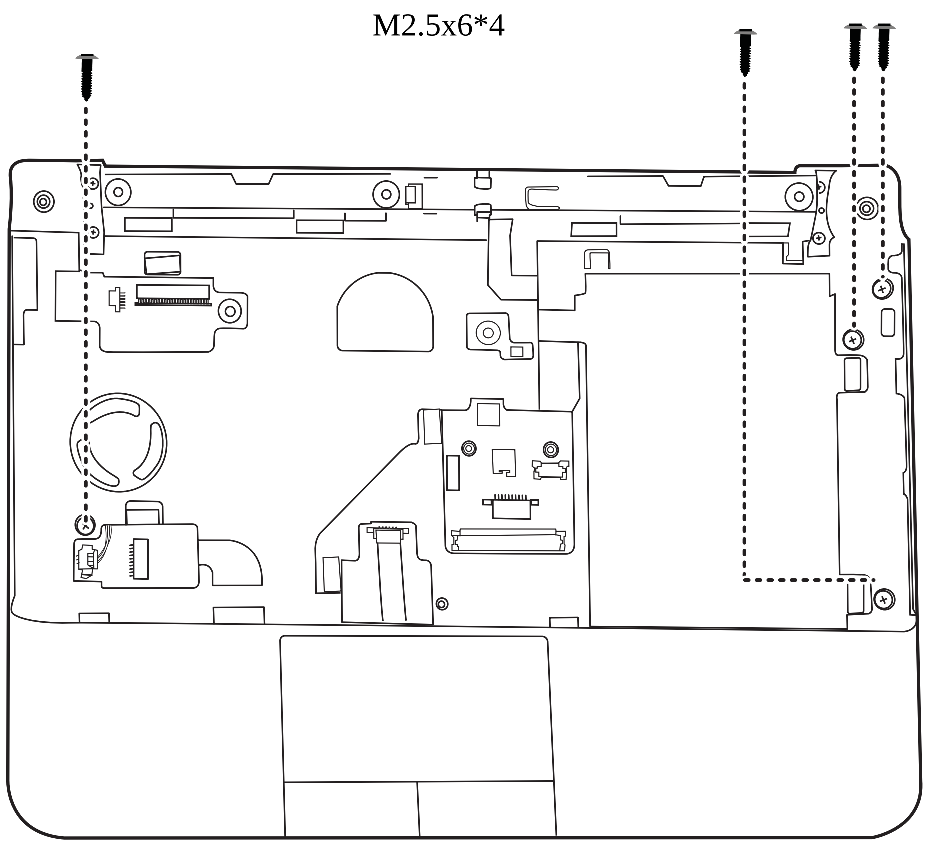


Figure 4.13 Removing three screws from under the keyboard

2. Remove any tape and then gently free the camera cable, microphone cable and antennas from their trough as indicated in Figure 4.14.

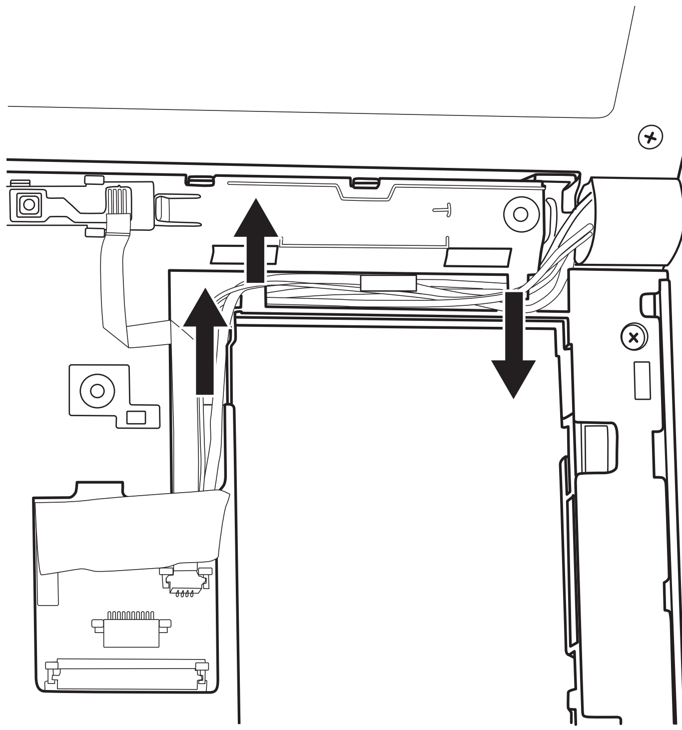


Figure 4.14 Freeing cables and antennas from the logic upper assembly

3. Remove one LVDS cable from the motherboard.

4. Take the cables and antennas from the left and right sides of the display hinge and move out of the way from the hinge screws.

> ***NOTE:*** *When removing the hinge screws, the cables and antennas on the left and right sides will be obstacles. Be sure to move any cables securely out of the way to ensure no scratching or damage occurs.*

5. Close the laptop. Remove two M2.5x6 screws from the hinge saddle as shown in Figure 4.15.

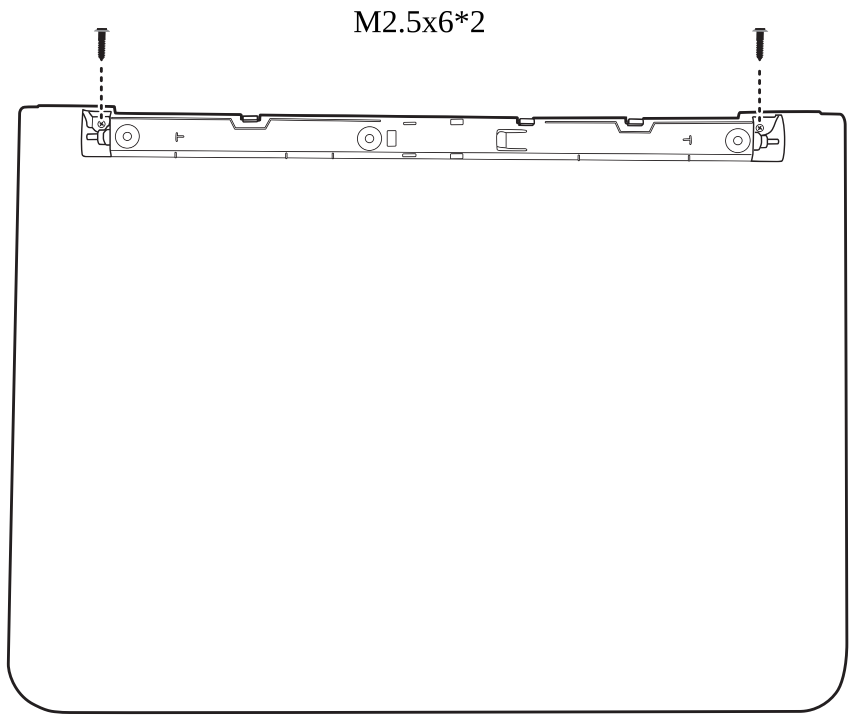


Figure 4.15 Removing the first pair of screws from the hinge saddle

6. Open the laptop and remove two M2.5x6 screws from the hinge saddle as shown in Figure 4.16.

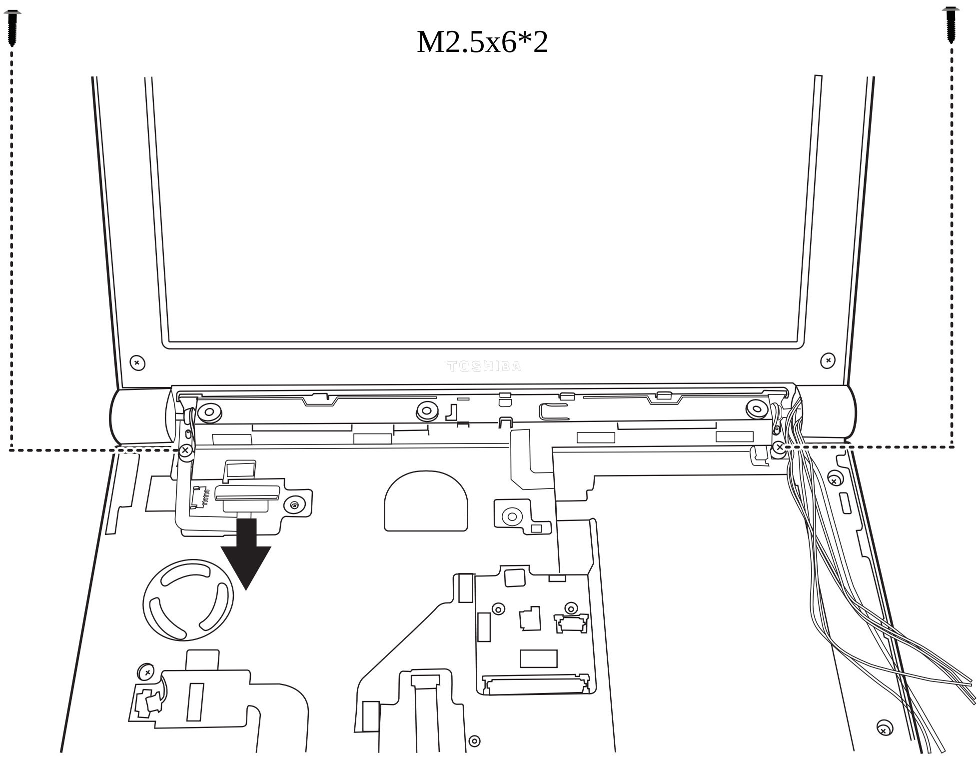


Figure 4.16 Removing the second pair of screws from the hinge saddle

7. Remove the LCD display assembly from the logic assembly.

8. Detach the Touch Pad cable and the Thermal Fan cable as shown in Figure 4.17. (Detach the touch pad cable by using tweezers to push the left and right latches of the connector in the direction of the arrow.)

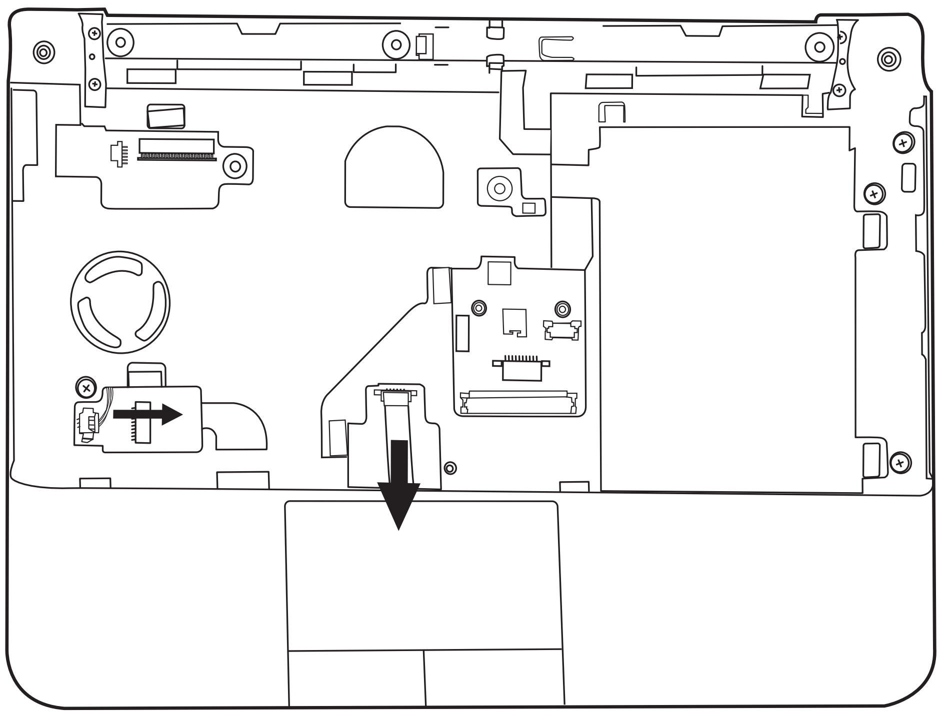


Figure 4.17 Detaching the cables from under the keyboard

9. Lift up the logic upper assembly.

Installing the Logic Upper Assembly

Install the logic upper assembly according to the following procedures.

1. Seat the logic upper assembly to the front of the laptop, and adjust to the correct position.

2. Connect the Thermal Fan cable.

3. To reconnect the touch pad cable, use tweezers and a finger to push down on the left and right latches of the connector. Both latches must be pushed simultaneously to secure the touch pad cable.

4. Secure the LCD display assembly with two M2.5x6 screws and attach the LVDS cable to the motherboard as shown in Figure 4.16.

5. Close the laptop and secure two M2.5x6 screws as indicated in Figure 4.15.
6. Open the laptop and secure four 2.5x6 screws on the laptop as indicated in Figure 4.13.
7. Route first the WLAN antennas through the trough and then pull through the slot to the underside of the computer.
8. Route the camera cable and microphone cable through the trough and secure in the logic upper assembly with adhesive tape.

NOTE: *Take extra care in routing cables and antennas on Logic upper assembly. Improperly routed cables can become pinched or damaged and cause malfunction.*

4.9 Speaker

Removing the Speaker

Remove the Speaker according to the following procedures and Figure 4.18.

1. Remove two M2.5x7.7 screws as shown in Figure 4.18.
2. Detach the speaker cable from the motherboard and remove the speaker from the logic lower assembly.

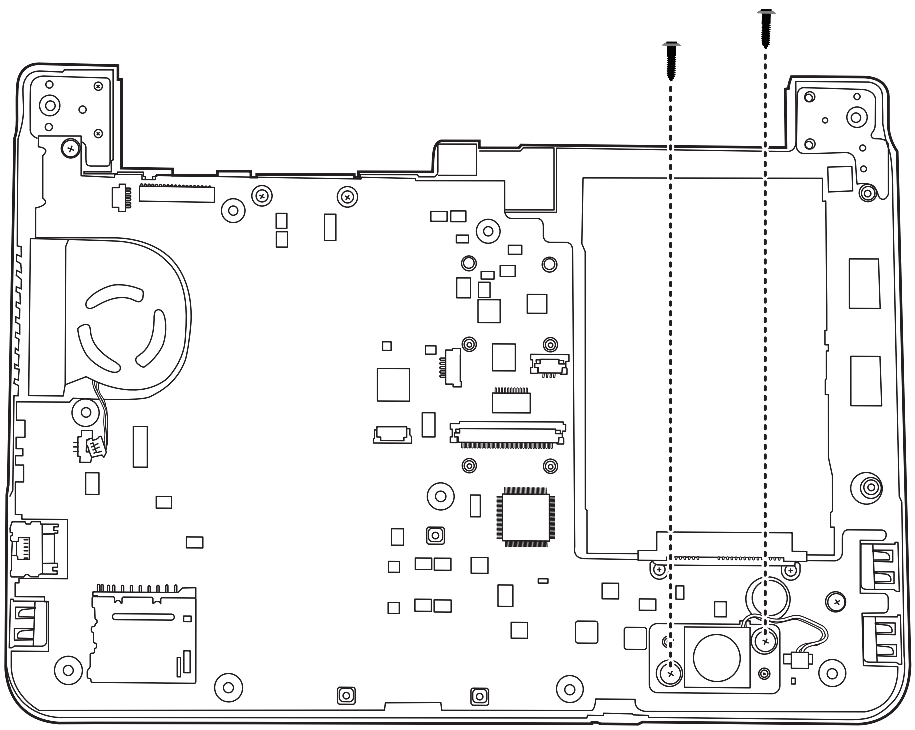


Figure 4.18 Removing the speaker

Installing the Speaker

Install the speaker according to the following procedures.

1. Seat the speaker in the correct position on the logic lower assembly.
2. Secure the speaker with two M2.5x7.7 screws.
3. Attach the speaker cable to the motherboard.

4.10 Touch Pad

Removing the touch pad bracket

Remove the touch pad bracket according to the following procedures and Figure 4.19.

1. Remove two M2.5x2.5 screws from the touch pad bracket as shown in Figure 4.19.

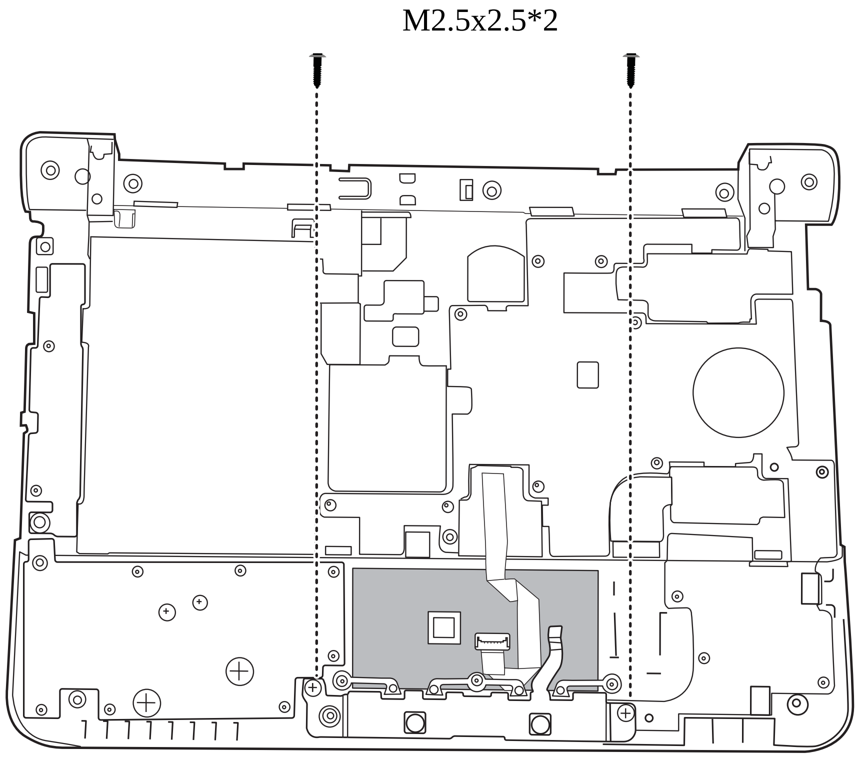


Figure 4.19 Removing the screws from the touch pad bracket

2. Remove the touch pad bracket from the logic upper assembly.

Installing the Touch Pad Bracket

Install the touch pad bracket according to the following procedures.

1. Seat the touch pad bracket in the correct position,
2. Secure the bracket with two M2.5x2.5 screws.

4.11 Motherboard

Removing the Motherboard

Remove the motherboard according to the following procedures and Figure 4.20, 4.21, 4.22 and 4.23.

1. Remove two M2.5x4 screws and FAN cable from the motherboard as indicated by the arrow in Figure 4.20.

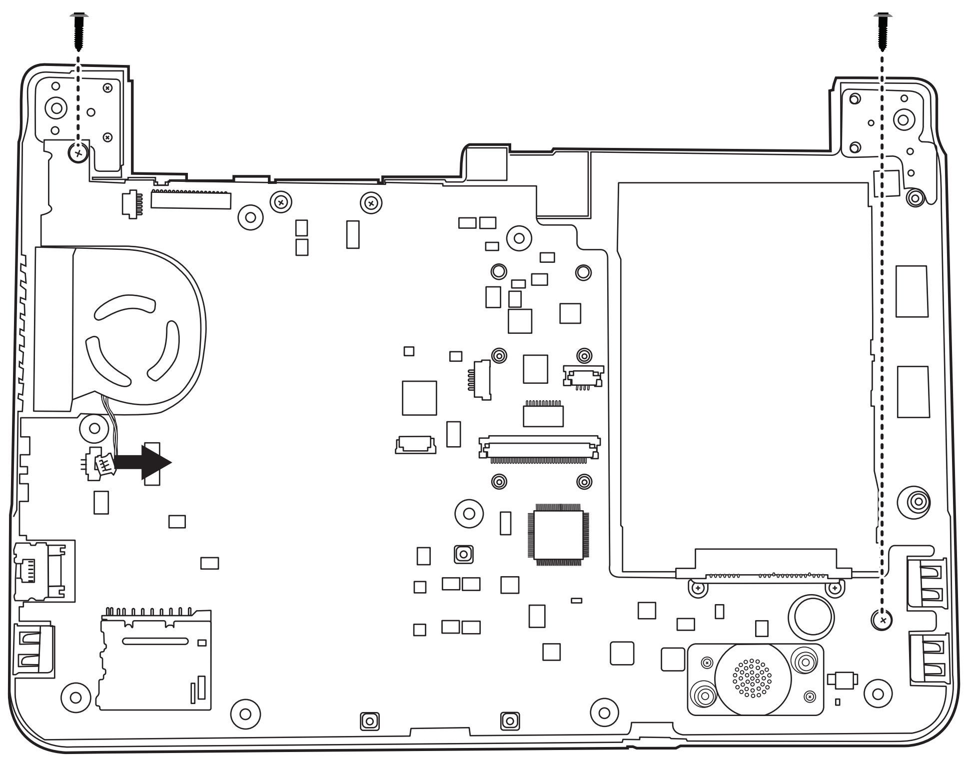


Figure 4.20 Removing the motherboard from logic lower assembly

2. Remove the plate from the logic lower assembly.

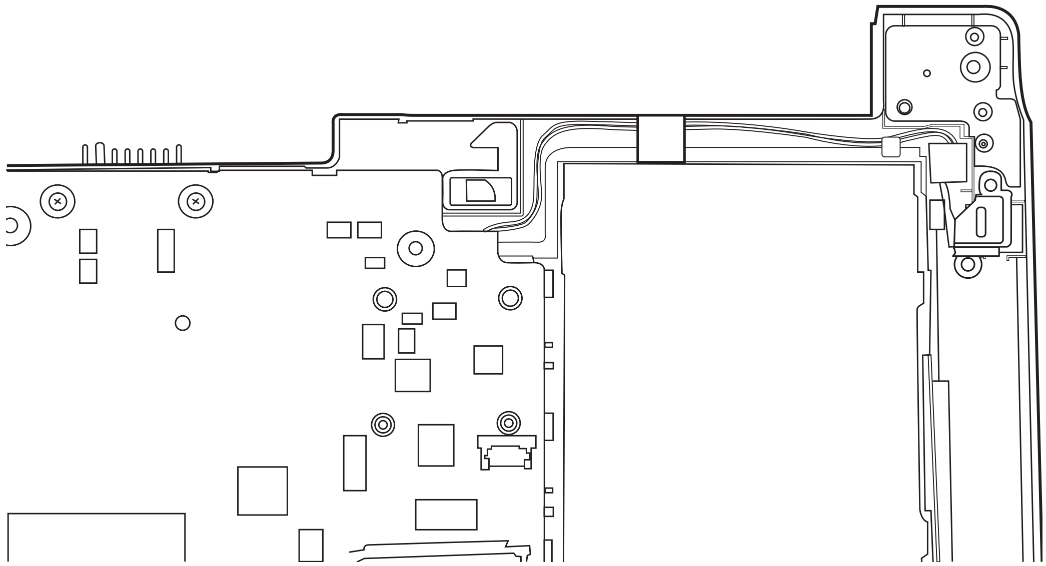


Figure 4.21 Removing the DC IN plate

3. Gently pull the cable out of the routing channel in the logic lower assembly from right to left, as shown in Figure 4.22.

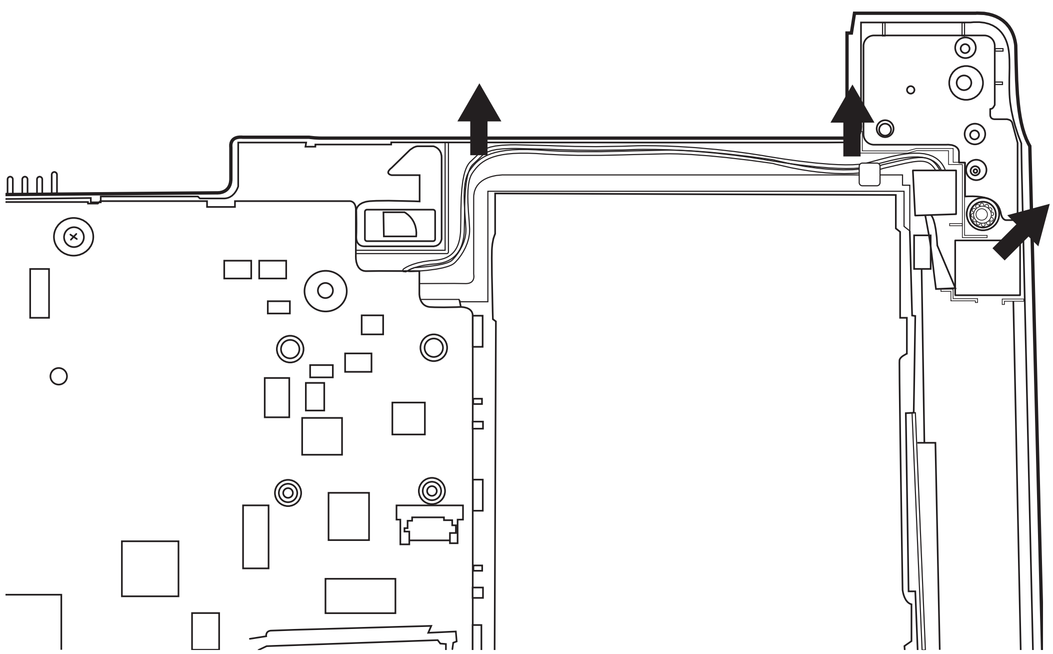


Figure 4.22 Removing the DC IN connector and cable

4. Use your hands to pick up the motherboard in the direction of the arrows as shown in figure 4.23.

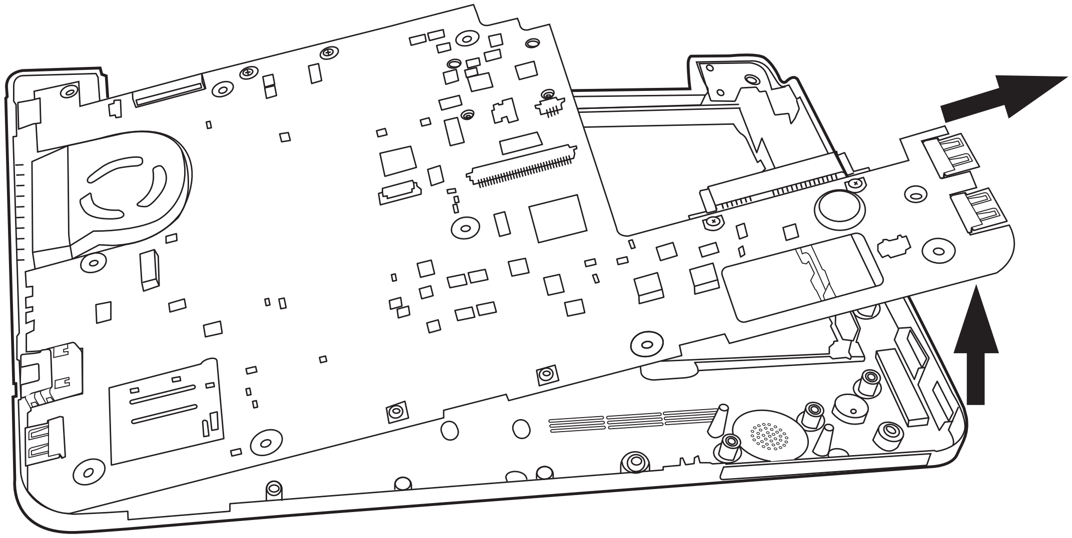


Figure 4.23 Picking up the motherboard

5. Remove the motherboard from the logic lower assembly.

Installing the Motherboard

Install the motherboard according to the following procedures and Figures 4.24 and 4.25.

1. Before seat the motherboard on the logic lower assembly, pull out the any cables to avoid them being pressed.

2. Align the connectors on the left side to their corresponding holes in the logic lower assembly as shown in Figure 4.24.

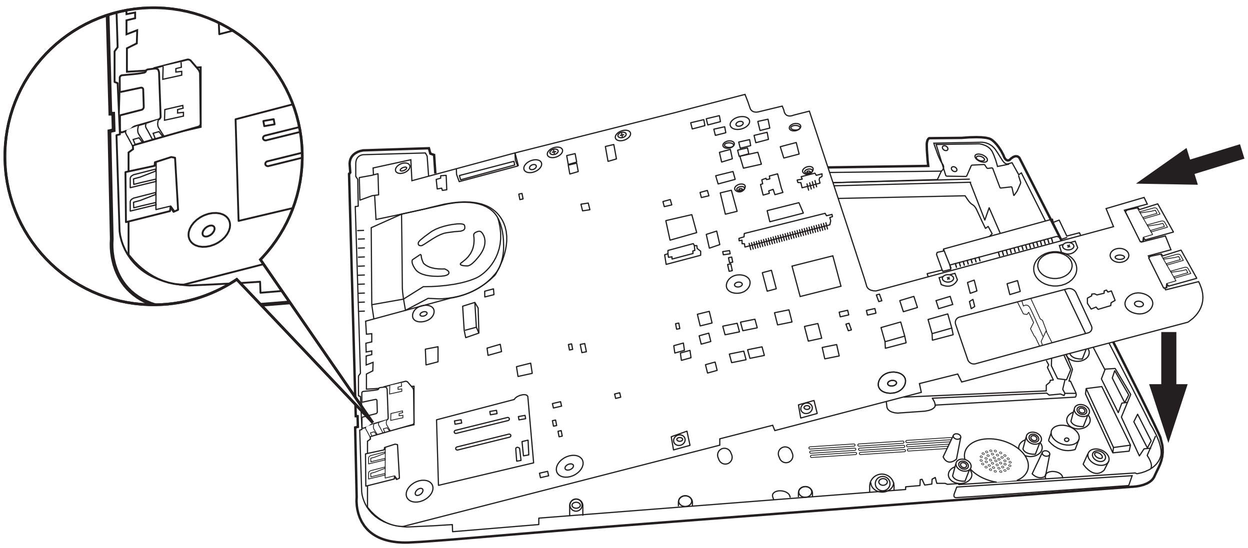


Figure 4.24 Aligning the motherboard connectors

3. Seat the motherboard down in the lower logic assembly.

4. Put the DC IN connector in the lower DC IN trough and route the cable from left to right under the ribs as shown in Figure 4.25. Fasten with tape.

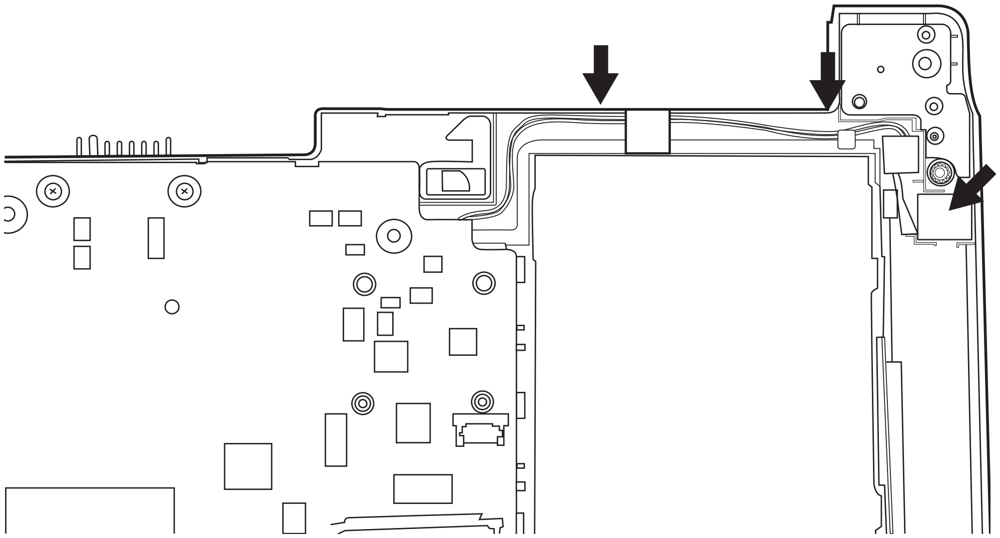


Figure 4.25 Installing the DC IN connector

5. Seat the DC IN plate in its correct position.

6. Secure two M2.5x4 screws and attach FAN cable to the motherboard as indicated by the arrow in Figure 4.20.

4.12 Thermal Fan Module

Removing the Thermal Fan Module

Remove the thermal fan module according to the following procedures and Figures 4.26 and 4.27.

> ***CAUTION:***
>
> *When removing the thermal fan module, keep the following in mind:*
>
> 1. *The unit can become very hot during operation. Be sure to let it cool down before starting the repair work.*
> 2. *Use care when removing and disassembling the unit in order to avoid damage.*
> 3. *If you remove the thermal module, please use a soft cloth with alcohol to clean the thermal fan module. If you use a new module, please make sure to remove any release paper first.*

1. Remove three M2.5x3 screws securing the thermal fan module to the motherboard in order as shown in Figure 4.26.

2. Remove the thermal module from the motherboard.

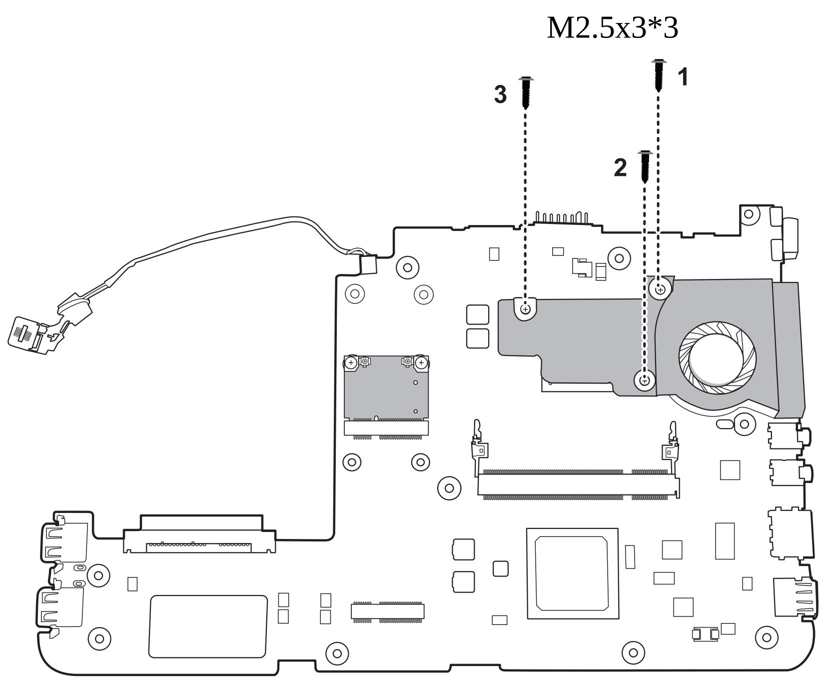


Figure 4.26 Removing the Thermal Fan Module

Installing the Thermal Fan Module

Install the Thermal Fan Module according to the following procedures and Figure 4.27.

1. Apply a new thermal pad on the thermal fan module as shown in Figure 4.27. If you use a new thermal fan module, remove any release papers on the thermal pads first.

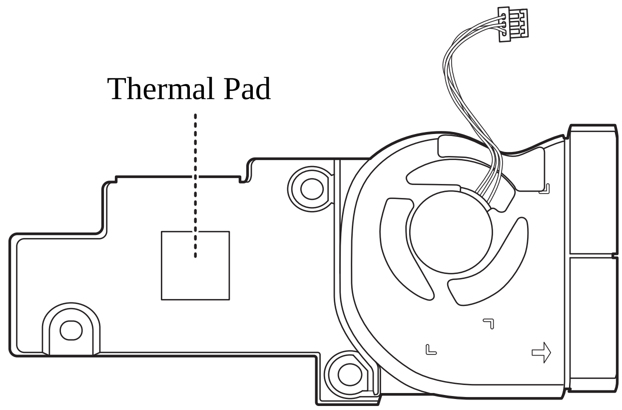


Figure 4.27 Applying the thermal pad on the thermal module

2. Seat the thermal fan module in the correct position on the motherboard and secure it with three M2.5x3 screws in reverse order (3-2-1) of that shown in Figure 4.26.

4.13 LCD Bezel Assembly

Removing the LCD Bezel Assembly

Remove the LCD bezel assembly according to the following procedures and Figures 4.28, 4.29 and 4.30.

1. Remove the two mask seals that cover the screws.
2. Remove two M2.5x5 screws as shown in Figure 4.28.

M2.5x5*2

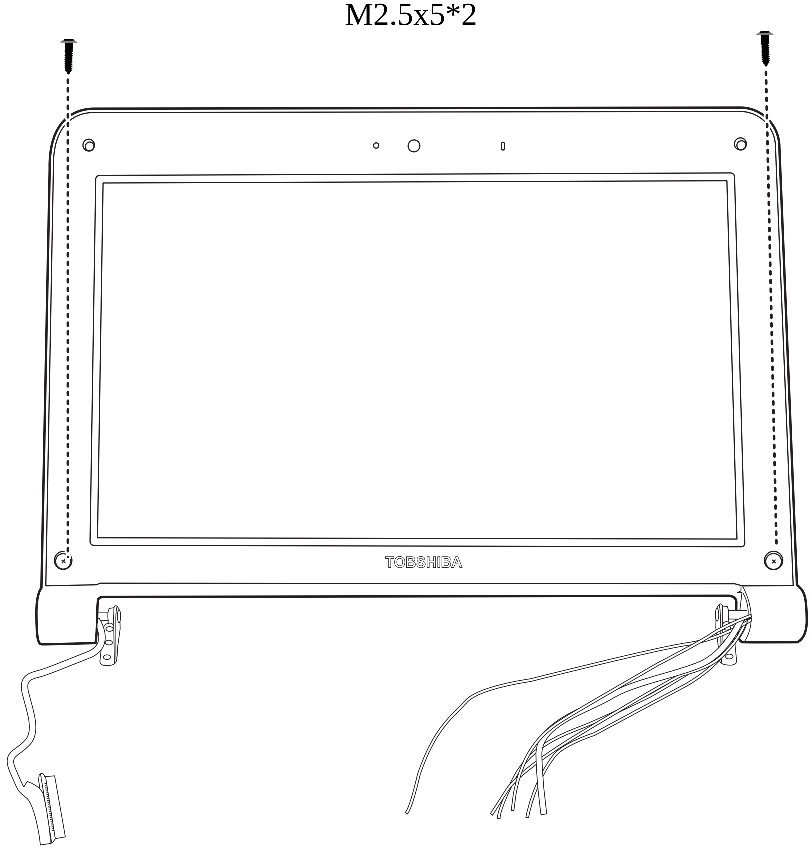


Figure 4.28 Removing screws from the LCD Bezel Assembly

3. Remove the bezel from each side of the hinge wall in the order shown in Figure 4.29.

> ***NOTE:*** *The sides of the bezel are secured tightly. Remove slowly and take extra caution to prevent your nails from becoming broken or from scratching the LCD surface.*

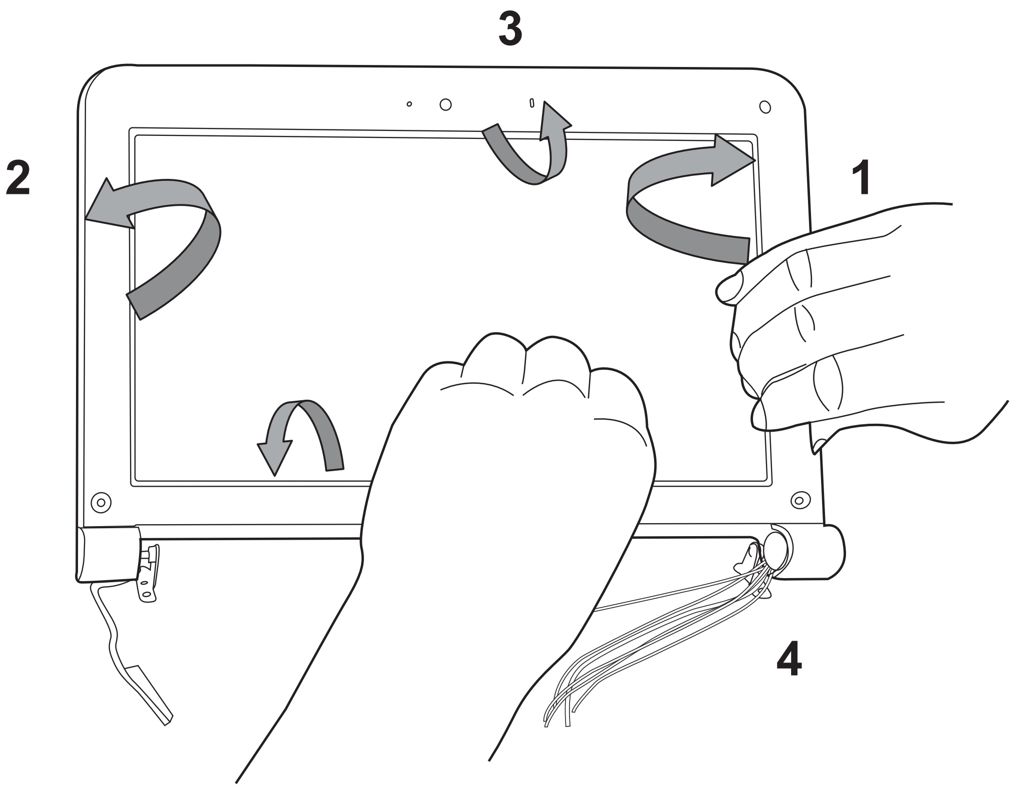


Figure 4.29 Removing the bezel from the hinge wall

4. Push the bezel from the left and right side as shown in Figure 4.30 and remove the bezel from the display assembly.

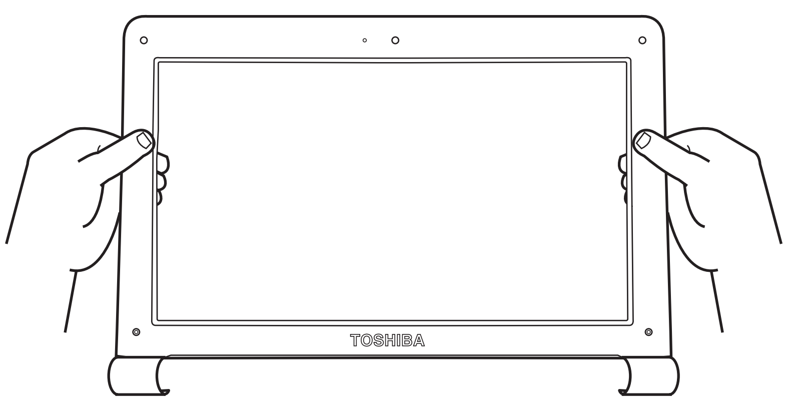


Figure 4.30 Removing the bezel from the display assembly

Installing the LCD Bezel Assembly

Install the LCD bezel assembly according to the following procedures.

> ***NOTE:*** *Take extra care in routing cables and antennas on the LCD module. Improperly routed cables can become pinched or damaged and cause malfunction.*

1. Seat the LCD bezel assembly in the correct position.
2. Press the bezel hinge wall against the cover hinge wall. Press the left and right side of the bezel as shown in Figure 4.31. Make sure the bezel clicks into place.
3. Secure it to the display assembly with two M2.5x5 screws.
4. Adhere the two mask seals to the screws.

4.14 LCD Module

Removing the LCD Module

Remove the LCD module according to the following procedures and Figures 4.31 and 4.32.

1. Remove four M2.5x4 screws securing the LCD module to the LCD cover assembly.
2. Pull up the camera from the LCD cover assembly without disconnecting it from the connector.

> ***NOTE:*** *Camera module is fastened by adhesive tape. Remove it slowly and carefully.*

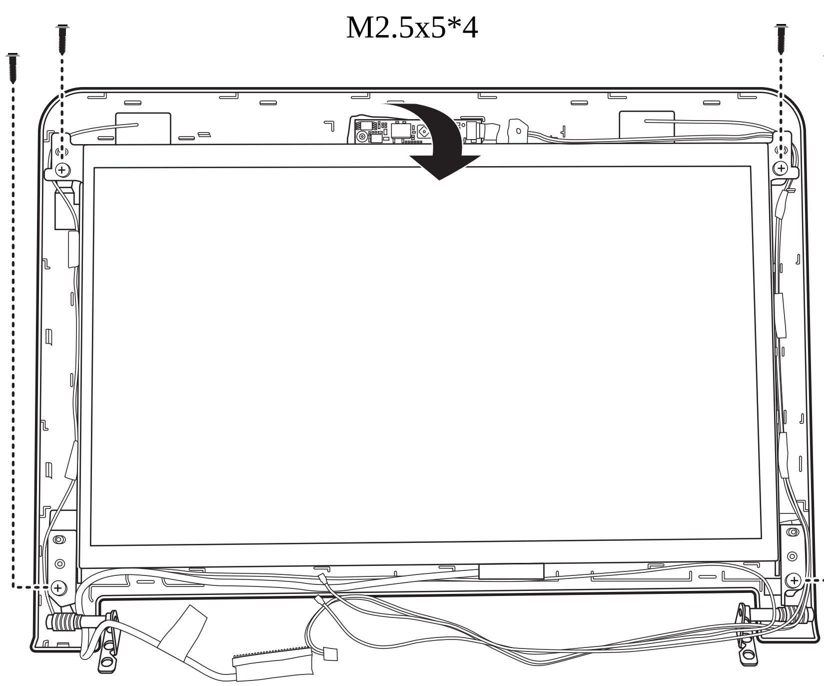


Figure 4.31 Removing the screws from the LCD module

3. Lift the LCD module out of the LCD cover assembly and remove it.

4. Remove four M2x3 screws that secure the LCD hinge assembly to the LCD panel and then remove the LCD hinge assembly, as shown in Figure 4.32.

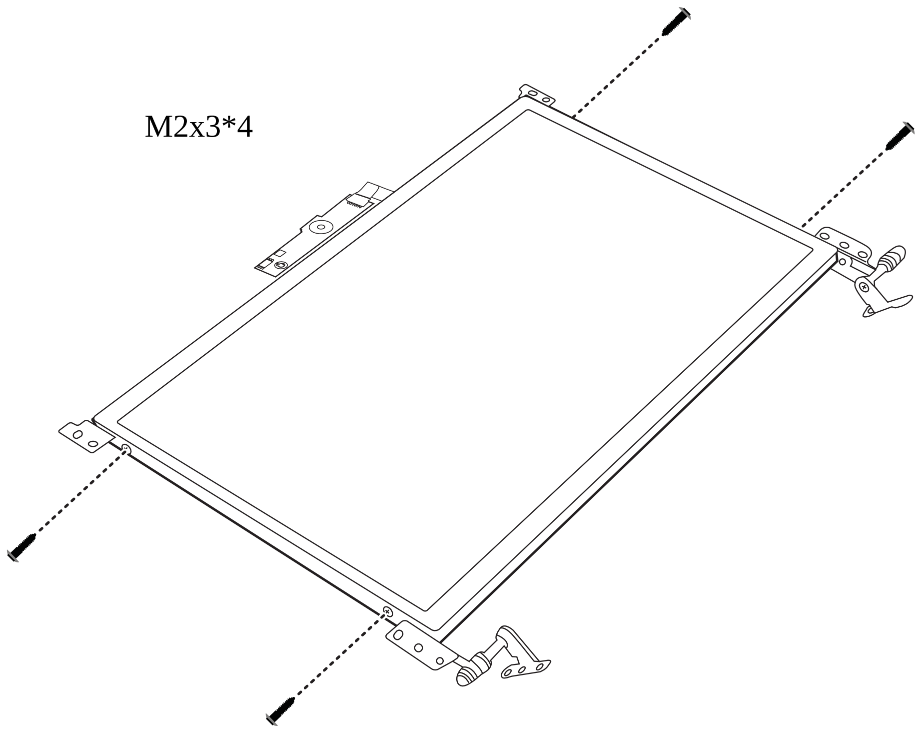


Figure 4.32 Removing the LCD Hinge Assembly

> ***NOTE:***
>
> *Integrated Circuits (ICs) are fragile. Use extreme care not to apply pressure to the ICs along the edges of the LCD module.*
>
> *Dispose of used LCD panels (fluorescent (FL) tubes) as required by local ordinances or regulations.*

Installing the LCD Module

Install the LCD module according to the following procedures.

1. Seat the LCD hinges in the correct positions on the LCD panel and secure them with four M2x3 screws.

2. Seat the LCD module in the correct position in the LCD cover assembly.

3. Secure the LCD module to the LCD cover assembly with four M2.5x4 screws.

4.15 Camera module LVDS cable

Removing the Camera module and LVDS Cable

Remove the Camera module and LVDS cable according to the following procedures and Figures 4.33 and 4.34.

1. Turn the LCD panel over and place it face down on a protective surface such as a foam pad.

2. Disconnect the camera from the connector and remove it, as shown in Figure 4.33.

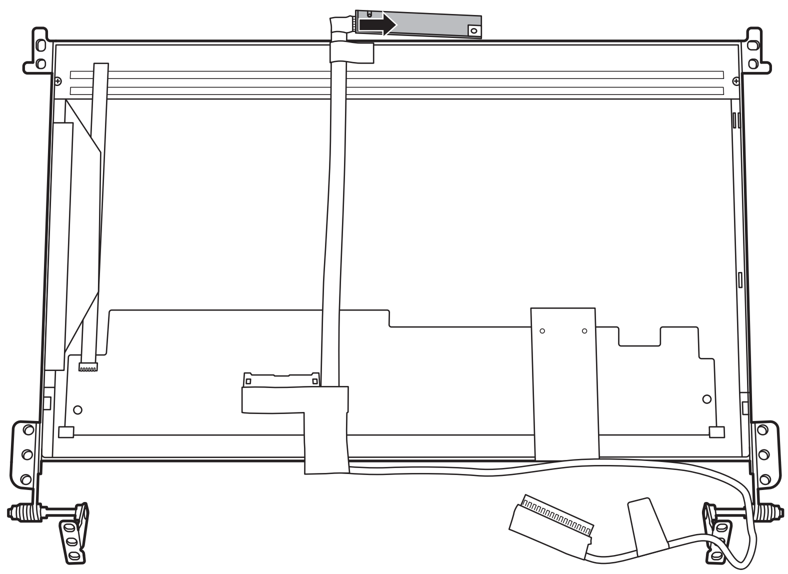


Figure 4.33 Removing the Camera from the LCD panel

3. Carefully peel up the LVDS cable, starting from the top, as shown in Figure 4.34. Once the LVDS cable has been peeled up disconnect it from the LCD panel, taking care not to damage the connector. Remove the LVDS cable.

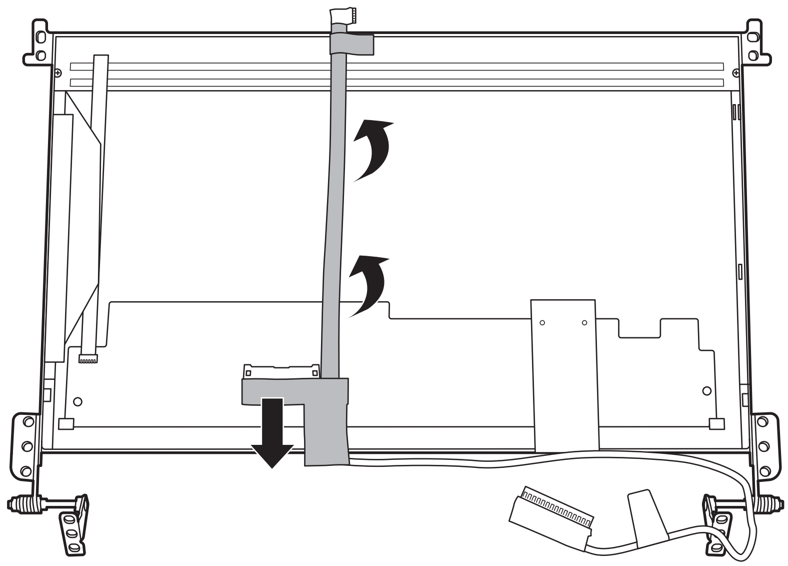


Figure 4.34 Removing the LVDS cable from the LCD module

Installing the Camera module and LVDS Cable

Install the camera module and LVDS cable according to the following procedures.

> ***NOTE:*** *Take extra care in routing cables and antennas on the LCD module. Improperly routed cables can become pinched or damaged and cause malfunction.*

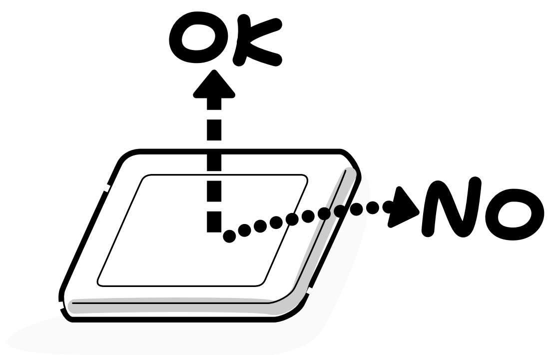
1. Connect the LVDS cable to the connector on the back of the LCD module.
2. Adhere the LVDS cable in the correct position on the LCD module.
3. Connect the camera to the camera connector on the LVDS cable.

Appendix A Handling the LCD Module

Precautions for handling the LCD module

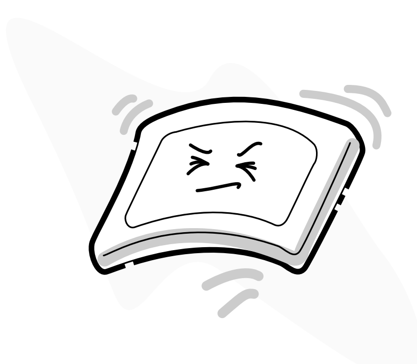
The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling it to prevent damaging it.

1. When installing the LCD module in the display assembly, make sure that you seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

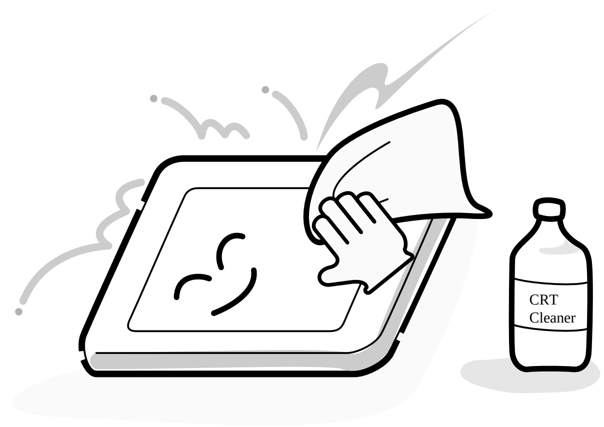
   Note: The panel's polarized surface is easily scratched and damaged, so handle it carefully.





3. If the panel’s surface gets dirty or moist, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

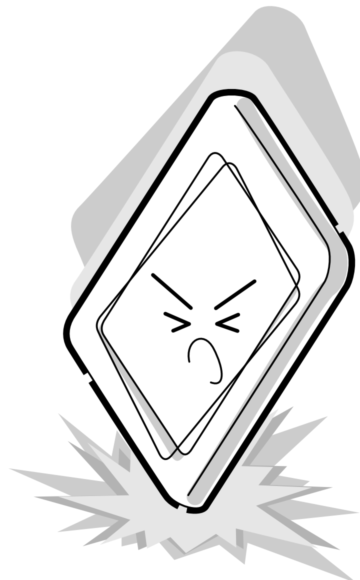
   If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a soft cloth and then wipe the panel’s surface. Do not apply cleanser directly to the panel.



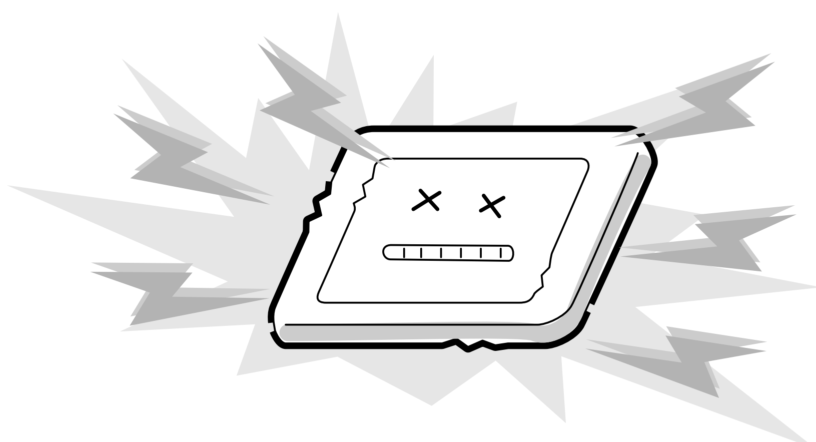
4. If water or other liquid is left on the panel’s surface for a long period, it can change the screen’s tint or stain it. Be sure to quickly wipe off any liquid.



5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle grounding device when handling the module.



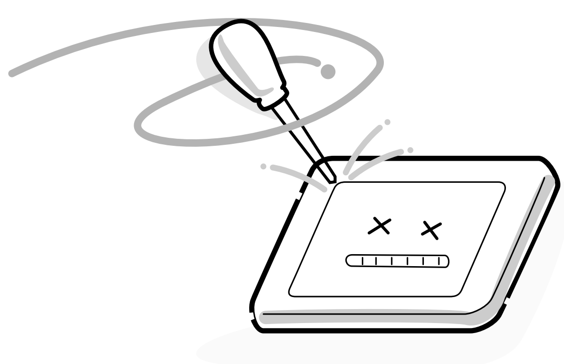
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



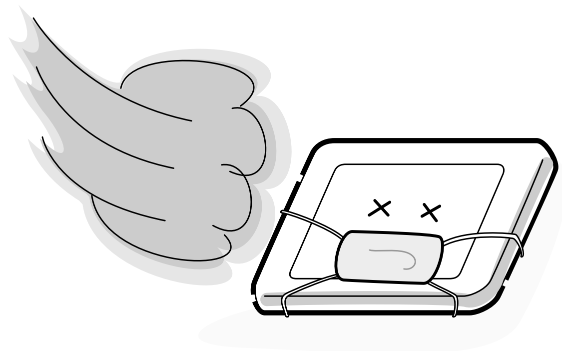
8. Do not store the module at temperatures below its specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panel's polarization.



Appendix B Board Layout

B.1 System Board Top View

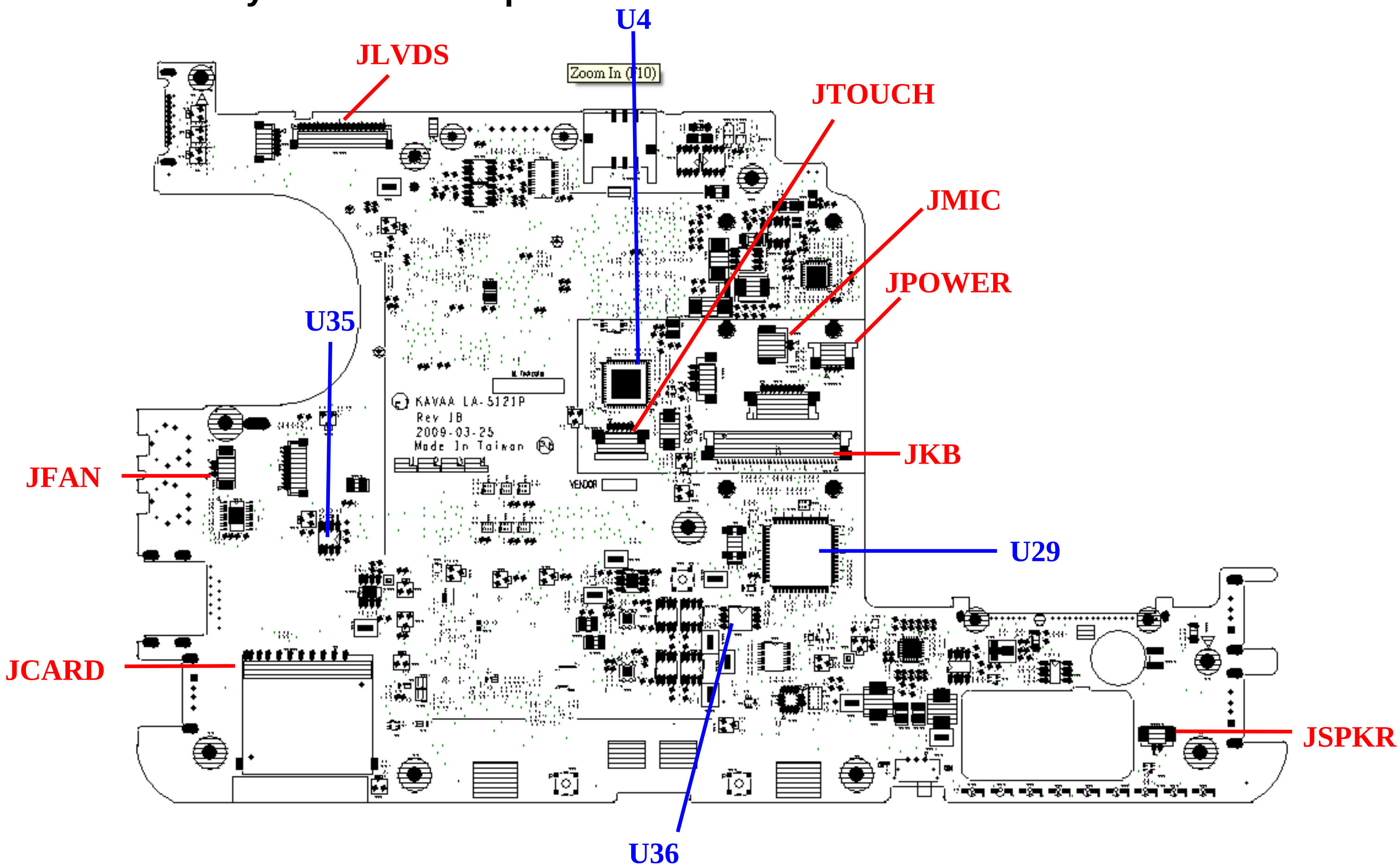


Figure B-1 System Board Layout (Top)

B.2 System Board Bottom View

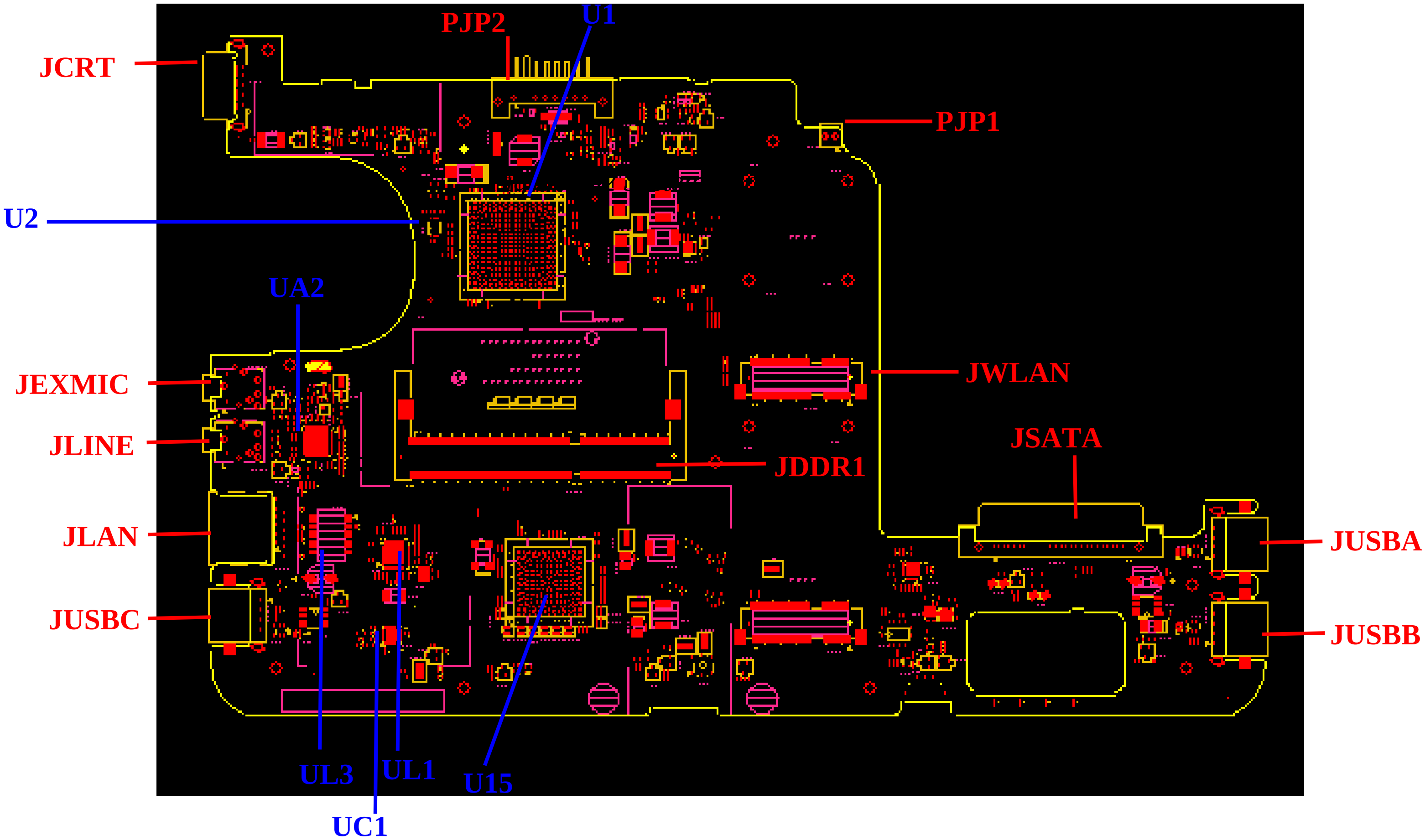


Table B-1 System Board ICs (top and bottom)

Number	Name
U1	Intel Atom_
U2	Thermal Sensor_EMC1402
U4	Clock Generator_RTM875N-397-GR
U15	South Bridge_Intel NM10
U29	EC_KB926QFE0
U35	FAN Control IC_APL5607KI-TRG
U36	BIOS ROM
UA2	Codec_ALC259-VB5-GR
UC1	Card Reader_RTS5138-GR
UL1	10/100 LAN_RTL8105E-GR
UL3	LAN Transformer_S X'FORM_ NS681695

Table B-2 System Board Connectors (top and bottom)

Number	Name
JLVDS	LVDS conn.
JFAN	Fan conn.
JDDR1	DDRIII conn.
JCRT	CRT conn.
JPOWER	Power/B conn.
JSATA	SATA HDD conn.
JCARD	Card Reader conn.
JMIC	Microphone conn.
JSPKR	Speaker conn.
JLAN	LAN conn.
JWLAN	WLAN conn.
JUSBA	USB/A conn.
JUSBB	USB/B conn.
JUSBC	USB/C conn.
JLINE	Headphones conn.
JEXMIC	External MIC conn.
JKB	Keyboard conn.
JTOUCH	TP/B conn.
PJP1	AC Adaptor conn.
PJP2	Battery conn.

Appendix C Pin Assignments

System Board

C.1 JFAN

Table C-1 FAN I/F pin assignments (3-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+FAN1		2	FAN_SPEED1	
3	GND				

C.2 JLVDS

Table C-2 LVDS I/F pin assignments (20-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+LEDVDD		2	NC	
3	+LCDVDD_L		4	+3VS	
5	LCD_PWM		6	BKOFF#	
7	LVDS_SDA		8	LVDS_SCL	
9	GND		10	LVDS_A0	
11	LVDS_A0#		12	GND	
13	LVDS_A1		14	LVDS_A1#	
15	GND		16	LVDS_A2	
17	LVDS_A2#		18	GND	
19	LVDS_ACLK		20	LVDS_ACLK#	
21	GND		22	USB_N7_R	
23	USB_P7_R		24	+5VS	

C.3 JCRT

Table C-3 CRT pin assignments (15-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	CRT_R_L		2	CRT_G_L	
3	CRT_B_L		4	NC	
5	GND		6	GND	
7	GND		8	GND	
9	+CRT_VCC		10	GND	
11	NC		12	CRT_DDC_DAT	
13	HSYNC		14	VSYNC	
15	CRT_DDC_CLK				

C.4 JSATA

Table C-4 HDD I/F pin assignments (22-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	SATA_ITX_C_DRX_P0	
3	SATA_ITX_C_DRX_N0		4	GND	
5	SATA_IRX_DTX_N0		6	SATA_IRX_DTX_P0	
7	GND		8	+3VS	
9	+3VS		10	+3VS	
11	GND		12	GND	
13	GND		14	+5VS	
15	+5VS		16	+5VS	
17	GND		18	NC	
19	GND		20	NC	
21	NC		22	NC	

C.5 JWLAN

Table C-5 WLAN/WiMax Connector pin assignments (52-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NC		2	+3V_WLAN	
3	WLAN_BT_DATA		4	GND	
5	WLAN_BT_CLK		6	+1.5VS	
7	WLAN_CLKREQ#		8	LPC_FRAME#_R	
9	GND		10	LPC_AD3_R	
11	CLK_PCIE_WLAN#		12	LPC_AD2_R	
13	CLK_PCIE_WLAN		14	LPC_AD1_R	
15	GND		16	LPC_AD0_R	
17	NC		18	GND	
19	NC		20	XMIT_OFF#	
21	GND		22	PLT_RST#	
23	PCIE_PTX_C_IRX_N2		24	+3V_WLAN	
25	PCIE_PTX_C_IRX_P2		26	GND	
27	GND		28	+1.5VS	
29	GND		30	CLK_SMBCLK	
31	PCIE_ITX_C_PRX_N2		32	CLK_SMBDATA	
33	PCIE_ITX_C_PRX_P2		34	GND	
35	GND		36	USB20_N4	
37	GND		38	USB20_P4	
39	+3V_WLAN		40	GND	
41	+3V_WLAN		42	LED_WIMAX#	
43	GND		44	NC	
45	NC		46	NC	
47	NC		48	+1.5VS	
49	EC_TX_P80_DATA		50	GND	
51	EC_RX_P80_CLK		52	+3V_WLAN	

C.6 JLAN

Table C-6 LAN Connector pin assignments (12-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	RJ45_MIDI0+	I/O	2	RJ45_MIDI0-	I/O
3	RJ45_MIDI1+	I/O	4	NC	
5	NC		6	RJ45_MIDI1-	I/O
7	NC		8	NC	
9	+3V_LAN		10	LAN_SK_LAN_LINK#	
11	+3V_LAN		12	LAN_ ACTIVITY#	

C.7 JDDR1

Table C-7 SODIMM I/F pin assignments (204-PIN) (1/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+DIMM_VREF		2	GND	
3	GND		4	DDR_A_D4	
5	DDR_A_D0		6	DDR_A_D5	
7	DDR_A_D1		8	GND	
9	GND		10	DDR_A_DQS#0	
11	DDR_A_DM0		12	DDR_A_DQS0	
13	GND		14	GND	
15	DDR_A_D2		16	DDR_A_D6	
17	DDR_A_D3		18	DDR_A_D7	
19	GND		20	GND	
21	DDR_A_D8		22	DDR_A_D12	
23	DDR_A_D9		24	DDR_A_D13	
25	GND		26	GND	
27	DDR_A_DQS#1		28	DDR_A_DM1	
29	DDR_A_DQS1		30	DRAMRST#	
31	GND		32	GND	

Table C-7 SODIMM I/F pin assignments (204-PIN) (2/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
33	DDR_A_D10		34	DDR_A_D14	
35	DDR_A_D11		36	DDR_A_D15	
37	GND		38	GND	
39	DDR_A_D16		40	DDR_A_D20	
41	DDR_A_D17		42	DDR_A_D21	
43	GND		44	GND	
45	DDR_A_DQS#2		46	DDR_A_DM2	
47	DDR_A_DQS2		48	GND	
49	GND		50	DDR_A_D22	
51	DDR_A_D18		52	DDR_A_D23	
53	DDR_A_D19		54	GND	
55	GND		56	DDR_A_D28	
57	DDR_A_D24		58	DDR_A_D29	
59	DDR_A_D25		60	GND	
61	GND		62	DDR_A_DQS#3	
63	DDR_A_DM3		64	DDR_A_DQS3	
65	GND		66	GND	
67	DDR_A_D26		68	DDR_A_D30	
69	DDR_A_D27		70	DDR_A_D31	
71	GND		72	GND	
73	DDR_CKE0		74	DDR_CKE1_DI MMA	
75	+1.5V		76	+1.5V	
77	NC		78	NC	
79	DDR_A_BS2		80	DDR_A_MA14	
81	+1.5V		82	+1.5V	
83	DDR_A_MA12		84	DDR_A_MA11	
85	DDR_A_MA9		86	DDR_A_MA7	
87	+1.5V		88	+1.5V	
89	DDR_A_MA8		90	DDR_A_MA6	
91	DDR_A_MA5		92	DDR_A_MA4	
93	+1.5V		94	+1.5V	
95	DDR_A_MA3		96	DDR_A_MA2	

Table C-7 SODIMM I/F pin assignments (204-PIN) (3/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
97	DDR_A_MA1		98	DDR_A_MA0	
99	+1.5V		100	+1.5V	
101	M_CLK_DDR0		102	M_CLK_DDR1	
103	M_CLK_DDR#0		104	M_CLK_DDR#1	
105	+1.5V		106	+1.5V	
107	DDR_A_MA10		108	DDR_A_BS1	
109	DDR_A_BS0		110	DDR_A_RAS#	
111	+1.5V		112	+1.5V	
113	DDR_A_WE#		114	DDR_CS0_DIMMA#	
115	DDR_A_CAS#		116	M_ODT0	
117	+1.5V		118	+1.5V	
119	DDR_A_MA13		120	M_ODT1	
121	DDR_CS1_DIMMA#		122	NC	
123	+1.5V		124	+1.5V	
125	NC		126	+VREF_CA	
127	GND		128	GND	
129	DDR_A_D32		130	DDR_A_D36	
131	DDR_A_D33		132	DDR_A_D37	
133	GND		134	GND	
135	DDR_A_DQS#4		136	DDR_A_DM4	
137	DDR_A_DQS4		138	GND	
139	GND		140	DDR_A_D38	
141	DDR_A_D34		142	DDR_A_D39	
143	DDR_A_D35		144	GND	
145	GND		146	DDR_A_D44	
147	DDR_A_D40		148	DDR_A_D45	
149	DDR_A_D41		150	GND	
151	GND		152	DDR_A_DQS#5	
153	DDR_A_DM5		154	DDR_A_DQS5	
155	GND		156	GND	
157	DDR_A_D42		158	DDR_A_D46	

159	DDR_A_D43		160	DDR_A_D47	

Table C-7 SODIMM I/F pin assignments (204-PIN) (4/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
161	GND		162	GND	
163	DDR_A_D48		164	DDR_A_D52	
165	DDR_A_D49		166	DDR_A_D53	
167	GND		168	GND	
169	DDR_A_DQS#6		170	DDR_A_DM6	
171	DDR_A_DQS6		172	GND	
173	GND		174	DDR_A_D54	
175	DDR_A_D50		176	DDR_A_D55	
177	DDR_A_D51		178	GND	
179	GND		180	DDR_A_D60	
181	DDR_A_D56		182	DDR_A_D61	
183	DDR_A_D57		184	GND	
185	GND		186	DDR_A_DQS#7	
187	DDR_A_DM7		188	DDR_A_DQS7	
189	GND		190	GND	
191	DDR_A_D58		192	DDR_A_D62	
193	DDR_A_D59		194	DDR_A_D63	
195	GND		196	GND	
197	GND		198	PM_EXTTS#0	
199	+3VS		200	CLK_SMBDATA	
201	GND		202	CLK_SMBCLK	
203	+0.75VS		204	+0.75VS	

C.8 JMIC

Table C-8 Internal Microphone Connector pin assignments (2-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	INT_MIC		2	AGND	

C.9 JLINE

Table C-9 HEADPHONE Connector pin assignments (6-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	AGND		2	HP_L_R	
3	HP_R_R		4	NBA_PLUG	
5	AGND		6	NC	

C.10 JKB

Table C-10 Keyboard Connector pin assignments (34-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NC		2	NC	
3	CAPS_LED#		4	+3VS	
5	KSI1		6	KSI6	
7	KSI5		8	KSI0	
9	KSI4		10	KSI3	
11	KSI2		12	KSI7	
13	KSO15		14	KSO12	
15	KSO11		16	KSO10	
17	KSO9		18	KSO8	
19	KSO13		20	KSO7	
21	KSO6		22	KSO14	
23	KSO5		24	KSO3	
25	KSO4		26	KSO0	
27	KSO1		28	KSO2	
29	NC		30	NC	

31	NC		32	NC	
33	NC		34	NC	

C.11 JUSBA

Table C-11 USB Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCA		2	USB20_N0_R	
3	USB20_P0_R		4	GND	

C.12 JUSBB

Table C-12 USB/B Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCA		2	USB20_N1_R	
3	USB20_P1_R		4	GND	

C.13 JUSBC

Table C-13 USB/B Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCB		2	USB20_N4_R	
3	USB20_P4_R		4	GND	

C.14 JPOWER

Table C-14 POWER/B connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	PWR_ON_LED#		2	PWR_ON_LED	
3	ON/OFFBTN#_R		4	GND	

C.15 JCARD

Table C-15 CARD READER connector pin assignments (11-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	SD_DATA3		2	SDCMD	
3	GND		4	+VCC_3IN1	
5	SDCLK		6	GND	
7	SD_MS_DATA0		8	SD_DATA1	
9	SD_DATA2		10	SDWP#	
11	SDCD#				

C.16 JEXMIC

Table C-16 EXMIC connector pin assignments (6-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	AGND		2	MIC1_L_L	
3	MIC1_L_R		4	MIC_SENSE	
5	AGND		6	NC	

C.17 JSPKR

Table C-17 SPKR connector pin assignments (2-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	SPK_R1		2	SPK_R2	

C.18 JTOUCH

Table C-18 T/P connector pin assignments (6-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	TP_SWR	
3	TP_SWL		4	TP_DATA	
5	TP_CLK		6	+5VS	

Appendix D Keyboard Scan/Character Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 $	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (	0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	18	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[{	1A	9A	54	F0	54	
28	] }	1B	9B	5B	F0	5B	

Table D-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
29	\ |	2B	AB	5D	F0	5D	*5
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*2
38	K	25	A5	42	F0	42	*2
39	L	26	A6	4B	F0	4B	*2
40	; :	27	A7	4C	F0	4C	*2
41	‘ “	28	A8	52	F0	52	
43	Enter	1C	9C	5A	F0	5A	*3
44	Shift (L)	2A	AA	12	F0	12	
45	No.102 key	56	D6	61	F0	61	
46	Z	2C	AC	1A	F0	1A	
47	X	2D	AD	22	F0	22	
48	C	2E	AE	21	F0	21	
49	V	2F	AF	2A	F0	2A	
50	B	30	B0	32	F0	32	
51	N	31	B1	31	F0	31	
52	M	32	B2	3A	F0	3A	*2
53	, <	33	B3	41	F0	41	*2
54	. >	34	B4	49	F0	49	*2
55	/ ?	35	B5	4A	F0	4A	*2
57	Shift (R)	36	B6	59	F0	59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1				Code set 2					Note
		Make		Break		Make		Break			
58	Ctrl(L)	1D		9D		14		F0		14	*3
60	Alt (L)	38		B8		11		F0		11	*3
61	Space	39		B9		29		F0		29	
62	ALT (R)	E0	38	E0	B8	E0	11	E0	F0	11	
64	Ctrl(R)	E0	1D	E0	9D	E0	14	E0	F0	14	
75	Ins	E0	52	E0	D2	E0	70	E0	F0	70	*1
76	Del	E0	53	E0	D3	E0	71	E0	F0	71	*1
79	←	E0	4B	E0	CB	E0	6B	E0	F0	6B	*1
80	Home	E0	47	E0	C7	E0	6C	E0	F0	6C	*3
81	End	E0	4F	E0	CF	E0	69	E0	F0	69	*3
83	↑	E0	48	E0	C8	E0	75	E0	F0	75	*1
84	↓	E0	50	E0	D0	E0	72	E0	F0	72	*1
85	PgUp	E0	49	E0	C9	E0	7D	E0	F0	7D	*1
86	PgDn	E0	51	E0	D1	E0	7A	E0	F0	7A	*1
89	→	E0	4D	E0	CD	E0	74	E0	F0	74	*1
110	Esc	01		81		76		F0		76	
112	F1	3B		BB		05		F0		05	
113	F2	3C		BC		06		F0		06	
114	F3	3D		BD		04		F0		04	
115	F4	3E		BE		0C		F0		0C	
116	F5	3F		BF		03		F0		03	
117	F6	40		C0		0B		F0		0B	
118	F7	41		C1		83		F0		83	
119	F8	42		C2		0A		F0		0A	
120	F9	43		C3		01		F0		01	
121	F10	44		C4		09		F0		09	*3

Table D-1 Scan codes (set 1 and set 2) (4/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
122	F11	57	D7	78	F0 78	*3
123	F12	58	D8	07	F0 07	*3
124	PrintSc	*6	*6	*6	*6	*6
X	Fn	—	—	—	—	*4
X	Win	E0 5B	E0 DB	E0 1F	E0 F0 1F	
x	App	E0 5D	E0 DD	E0 2F	E0 F0 2F	

Notes:

1. * Scan codes differ by mode.
2. * Scan codes differ by overlay function.
3. * Combination with the **Fn** key gives different codes.
4. * The **Fn** key does not generate a code by itself.
5. * This key corresponds to key No. 42 in a 102-key model.
6. * Refer to Table D-6, No. 124 key scan code.
7. * Refer to Table D-7, No. 126 key scan code.

Table D-2 Scan codes with left Shift key

Cap No.	Key top	Code set 1								Code set 2									
		Make				Break				Make					Break				
55	/	E0	AA	E0	35	E0	B5	E0	2A	E0	F0	12	E0	4A	E0	F0	4A	E0	12
75	INS	E0	AA	E0	52	E0	D2	E0	2A	E0	F0	12	E0	70	E0	F0	70	E0	12
76	DEL	E0	AA	E0	53	E0	D3	E0	2A	E0	F0	12	E0	71	E0	F0	71	E0	12
79	←	E0	AA	E0	4B	E0	CB	E0	2A	E0	F0	12	E0	6B	E0	F0	6B	E0	12
80	Home	E0	AA	E0	47	E0	C7	E0	2A	E0	F0	12	E0	6C	E0	F0	6C	E0	12
81	End	E0	AA	E0	4F	E0	CF	E0	2A	E0	F0	12	E0	69	E0	F0	69	E0	12
83	↑	E0	AA	E0	48	E0	C8	E0	2A	E0	F0	12	E0	75	E0	F0	75	E0	12
84	↓	E0	AA	E0	50	E0	D0	E0	2A	E0	F0	12	E0	72	E0	F0	72	E0	12
85	PgUp	E0	AA	E0	49	E0	C9	E0	2A	E0	F0	12	E0	7D	E0	F0	7D	E0	12
86	PgDn	E0	AA	E0	51	E0	D1	E0	2A	E0	F0	12	E0	7A	E0	F0	7A	E0	12
89	→	E0	AA	E0	4D	E0	CD	E0	2A	E0	F0	12	E0	74	E0	F0	74	E0	12
X	Win	E0	AA	E0	5B	E0	DB	E0	2A	E0	F0	12	E0	1F	E0	F0	1F	E0	12
X	App	E0	AA	E0	5D	E0	DD	E0	2A	E0	F0	12	E0	2F	E0	F0	2F	E0	12

Note : The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left **Shift**	With right **Shift**
Set 1	E0 AA	E0 B6
	E0 2A	E0 36
Set 2	E0 F0 12	E0 F0 59
	E0 12	E0 59

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1 Make	Code set 1 Break	Code set 2 Make	Code set 2 Break
75	INS	E0 2A E0 52	E0 D2 E0 AA	E0 12 E0 70	E0 F0 70 E0 F0 12
76	DEL	E0 2A E0 53	E0 D3 E0 AA	E0 12 E0 71	E0 F0 71 E0 F0 12
79	←	E0 2A E0 4B	E0 CB E0 AA	E0 12 E0 6B	E0 F0 6B E0 F0 12
80	Home	E0 2A E0 47	E0 C7 E0 AA	E0 12 E0 6C	E0 F0 6C E0 F0 12
81	End	E0 2A E0 4F	E0 CF E0 AA	E0 12 E0 69	E0 F0 69 E0 F0 12
83	↑	E0 2A E0 48	E0 C8 E0 AA	E0 12 E0 75	E0 F0 75 E0 F0 12
84	↓	E0 2A E0 50	E0 D0 E0 AA	E0 12 E0 72	E0 F0 72 E0 F0 12
85	PgUp	E0 2A E0 49	E0 C9 E0 AA	E0 12 E0 7D	E0 F0 7D E0 F0 12
86	PgDn	E0 2A E0 51	E0 D1 E0 AA	E0 12 E0 7A	E0 F0 7A E0 F0 12
89	→	E0 2A E0 4D	E0 CD E0 AA	E0 12 E0 74	E0 F0 74 E0 F0 12
X	Win	E0 2A E0 5B	E0 DB E0 AA	E0 12 E0 1F	E0 F0 1F E0 F0 12
X	App	E0 2A E0 5D	E0 DD E0 AA	E0 12 E0 2F	E0 F0 2F E0 F0 12

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1 Make	Code set 1 Break	Code set 2 Make	Code set 2 Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	L-CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	L-ALT	E0 38	E0 B8	E0 11	E0 F0 11
80	Pause	*8		*8	
81	Break	*8		*8	
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C6	7E	F0 7E

Note:

8. * Refer to Table D-7, No. 126 key scan code.

Table D-5 Scan codes in overlay mode

Cap No.	Keytop		Code set 1 Make		Code set 1 Break		Code set 2 Make		Code set 2 Break		
09	8	(8)	48		C8		75		F0		75
10	9	(9)	49		C9		7D		F0		7D
11	0	(*)	37		B7		7C		F0		7C
23	U	(4)	4B		CB		6B		F0		6B
24	I	(5)	4C		CC		73		F0		73
25	O	(6)	4D		CD		74		F0		74
26	P	(–)	4A		CA		7B		F0		7B
37	J	(1)	4F		CF		69		F0		69
38	K	(2)	50		D0		72		F0		72
39	L	(3)	51		D1		7A		F0		7A
40	;	(+)	4E		CE		79		F0		79
52	M	(0)	52		D2		70		F0		70
54	.	(.)	53		D3		71		F0		71
55	/	(/)	E0	35	E0	B5	E0	4A	E0	F0	4A

Table D-6 No.124 key scan code

Key top	Shift	Code set 1 Make				Code set 1 Break				Code set 2 Make				Code set 2 Break					
Prt Sc	Common	E0	2A	E0	37	E0	B7	E0	AA	E0	12	E0	7C	E0	F0	7C	E0	F0	12
	Ctrl +		E0	37			E0	B7			E0	7C			E0	F0	7C		
	Shift +		E0	37			E0	B7			E0	7C			E0	F0	7C		
	Alt +			54			D4					84			F0	84			

Table D-7 No.126 key scan code

Key top	Shift	Code set 1	Code set 2
		Make	Make
Pause	Common	E1 1D 45 E1 9D C5	E1 14 77 E1 F0 14 F0 77
Break	Common	E0 46 E0 C6	E0 7E E0 F0 7E

*: This key generates only make codes.

Appendix E Key Layout

1. United Status (US) Keyboard

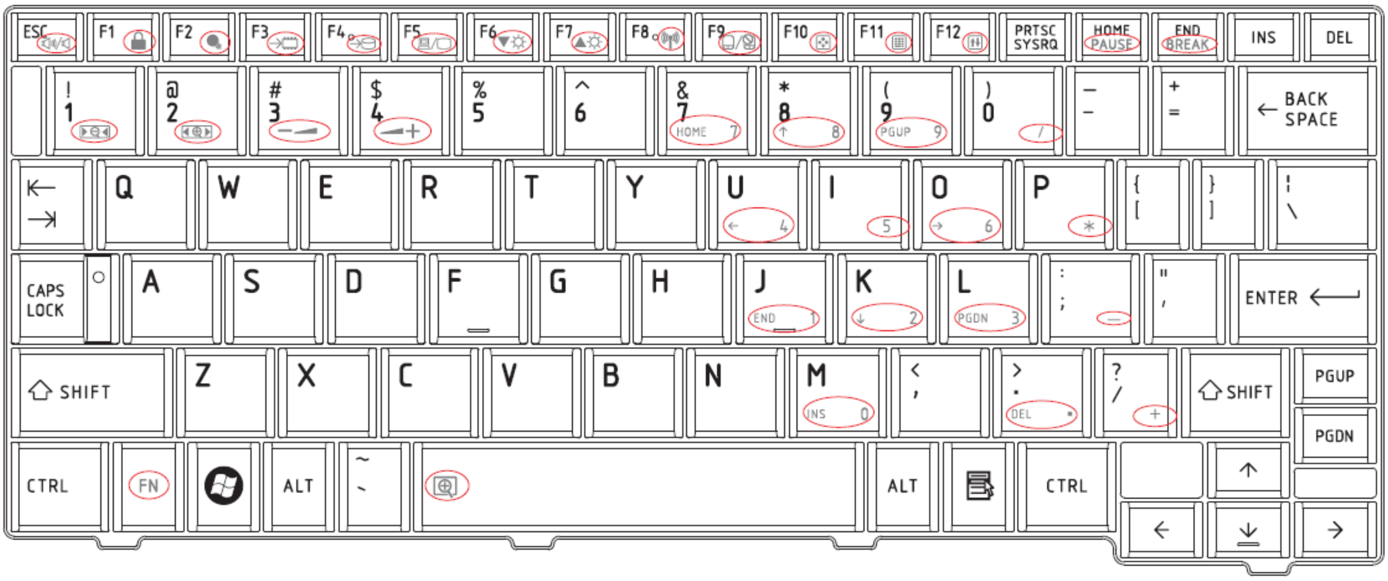


Figure US keyboard

2. Traditional Chinese (CH) Keyboard

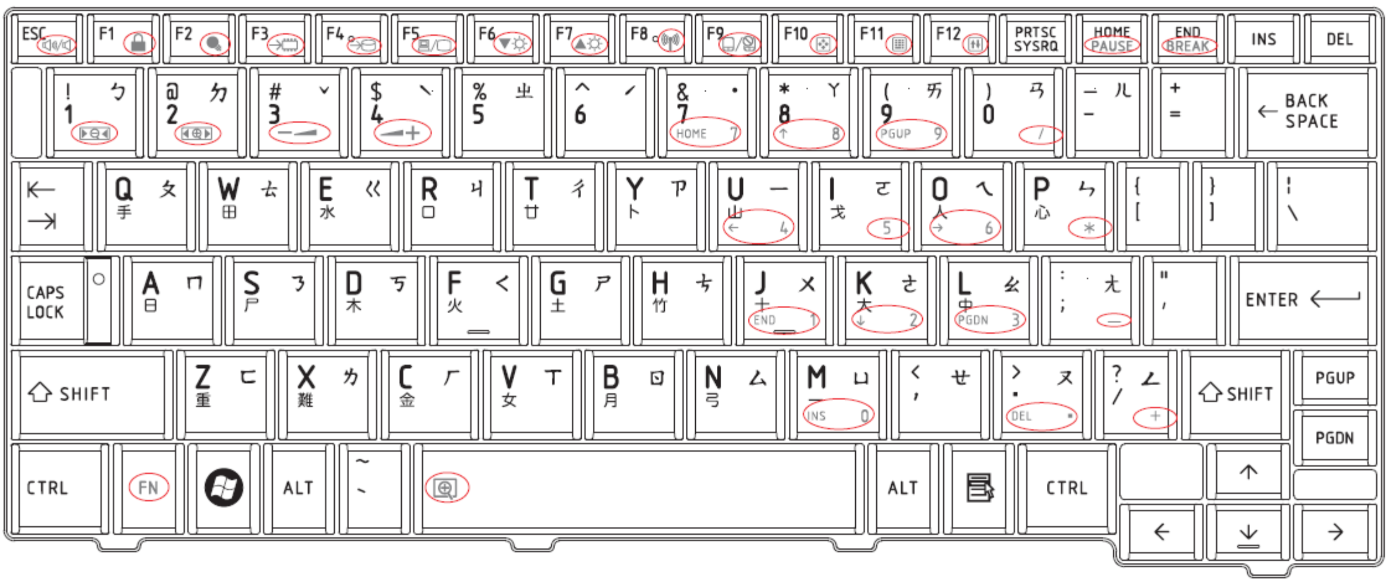


Figure CH keyboard

3. Thai (TI) Keyboard

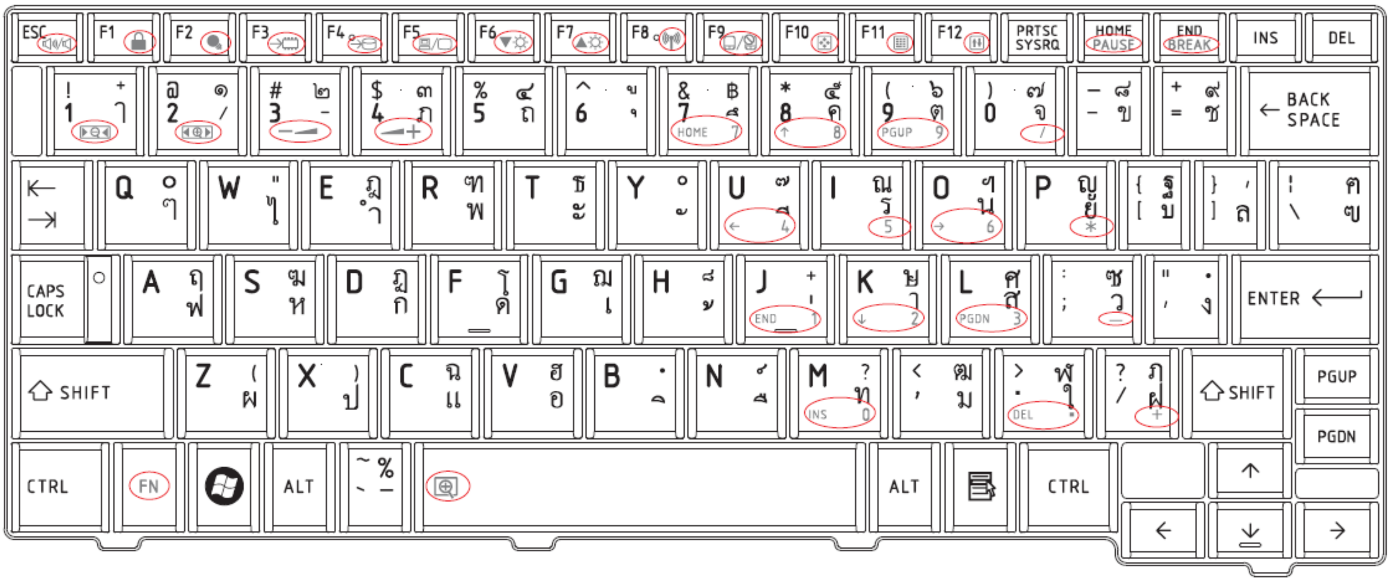


Figure TI keyboard

4. Korean (KO) Keyboard

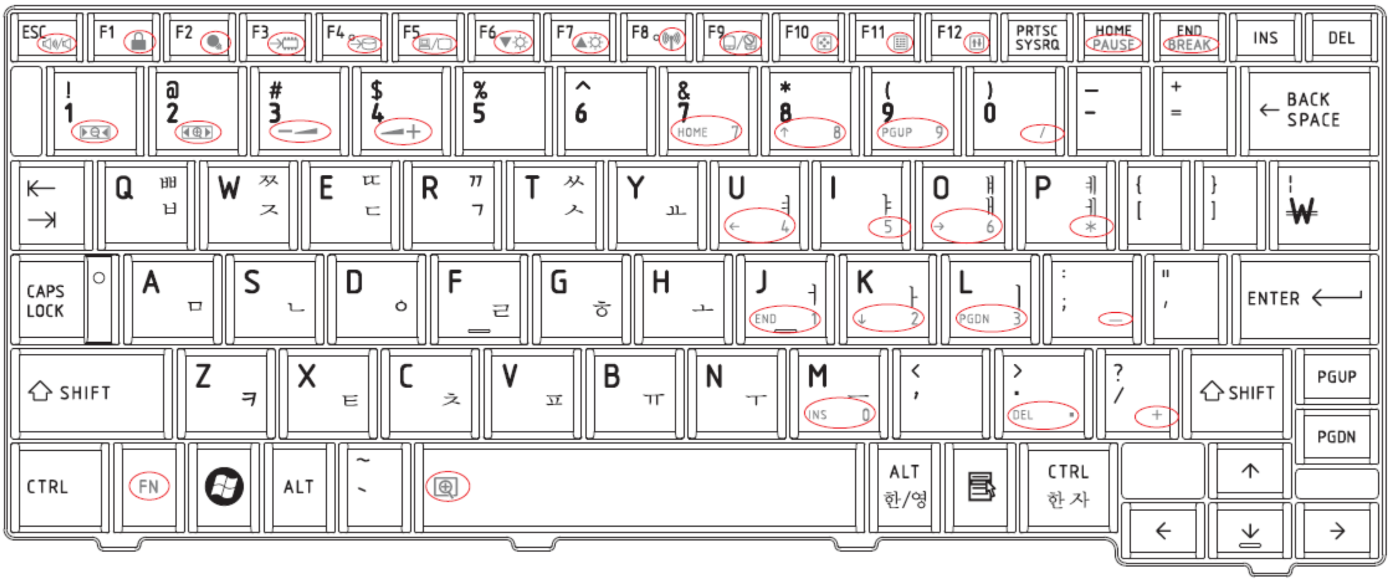


Figure KO keyboard

5. United Kingdom (UK) Keyboard

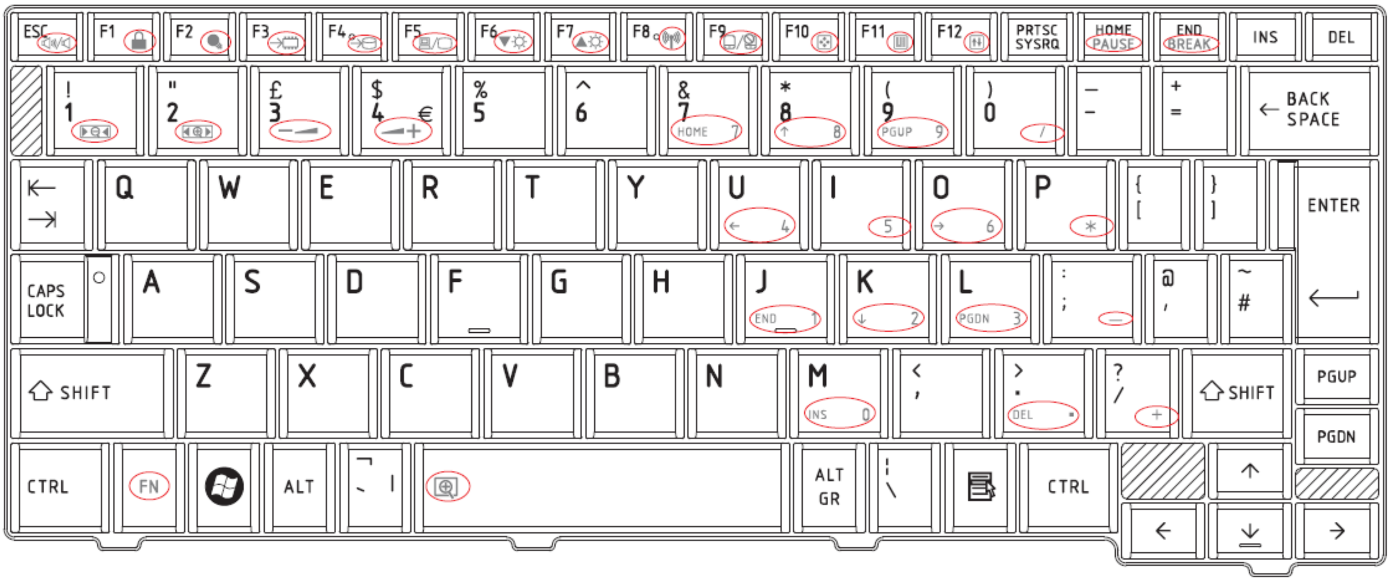


Figure UK keyboard

6. US International (UI) Keyboard

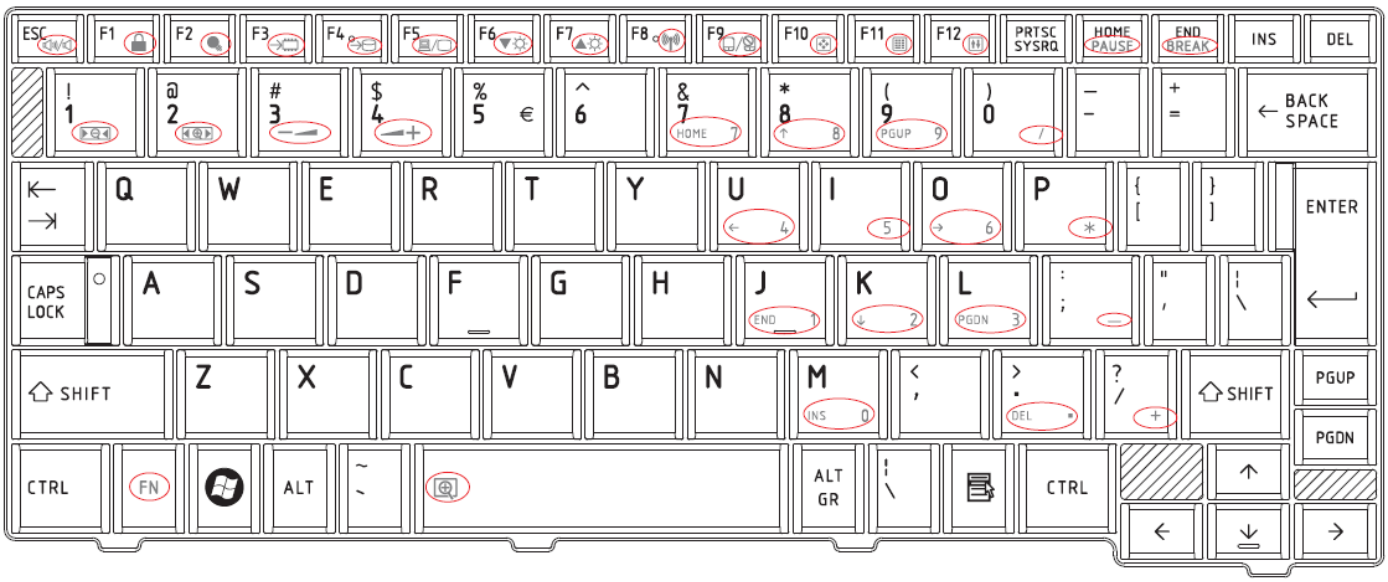


Figure UI keyboard

7. Hebrew (HB) Keyboard

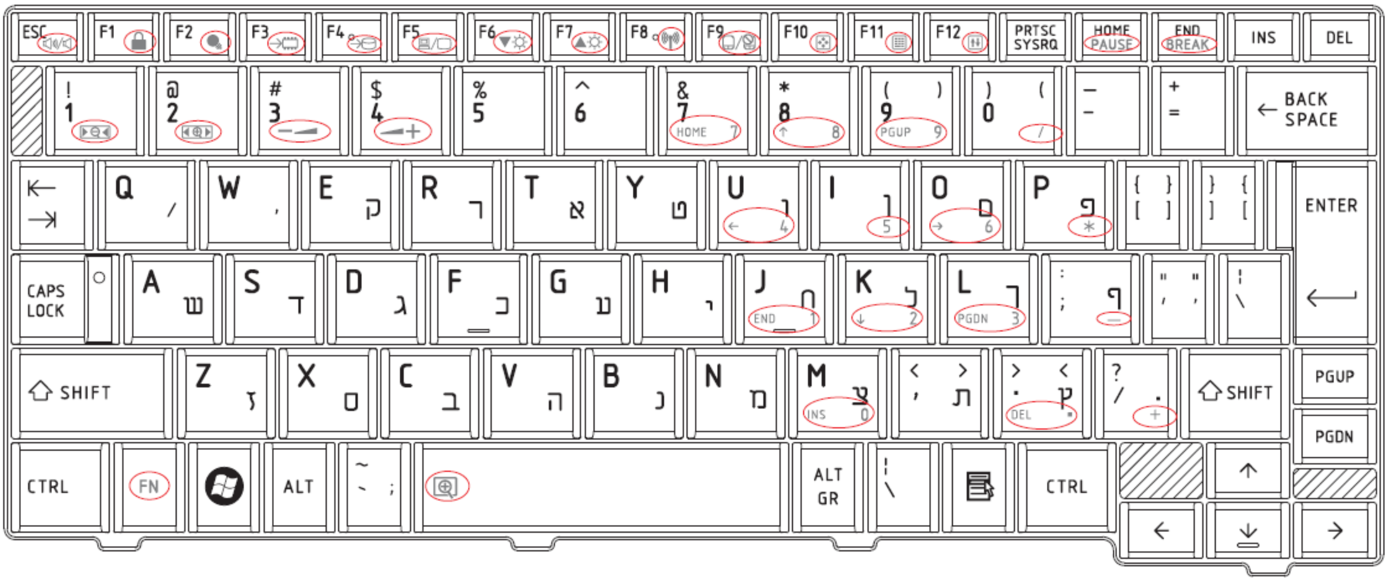


Figure HB keyboard

8. Danish (DM) Keyboard

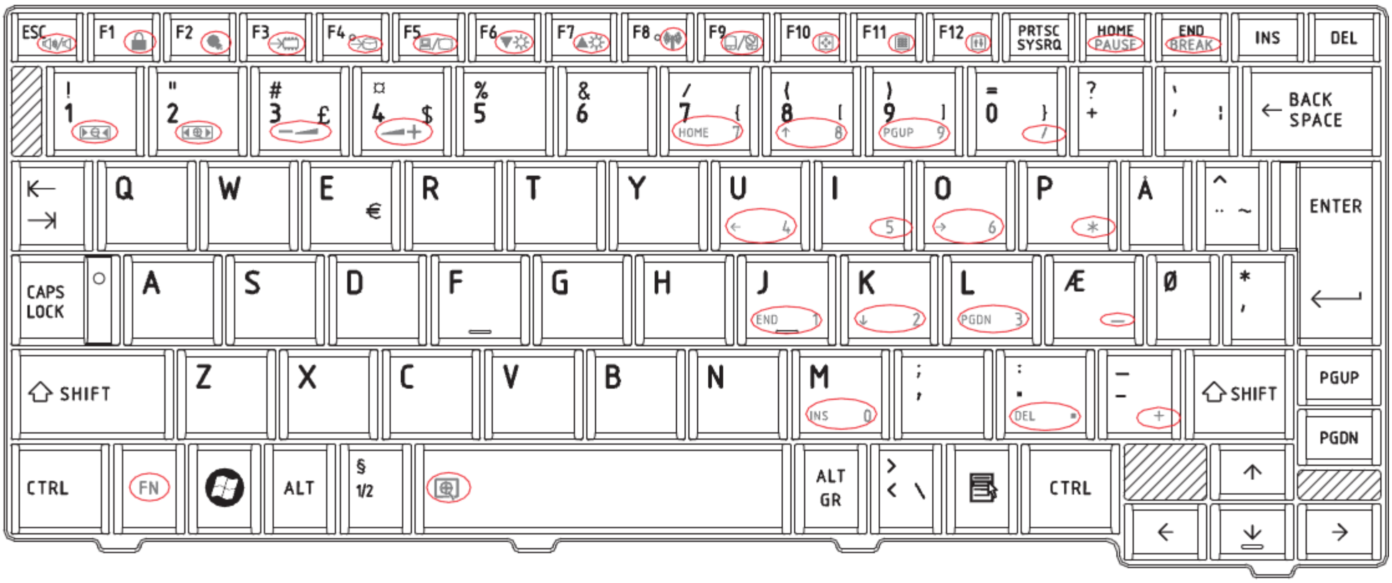


Figure DM keyboard

9. Swiss (SW) Keyboard

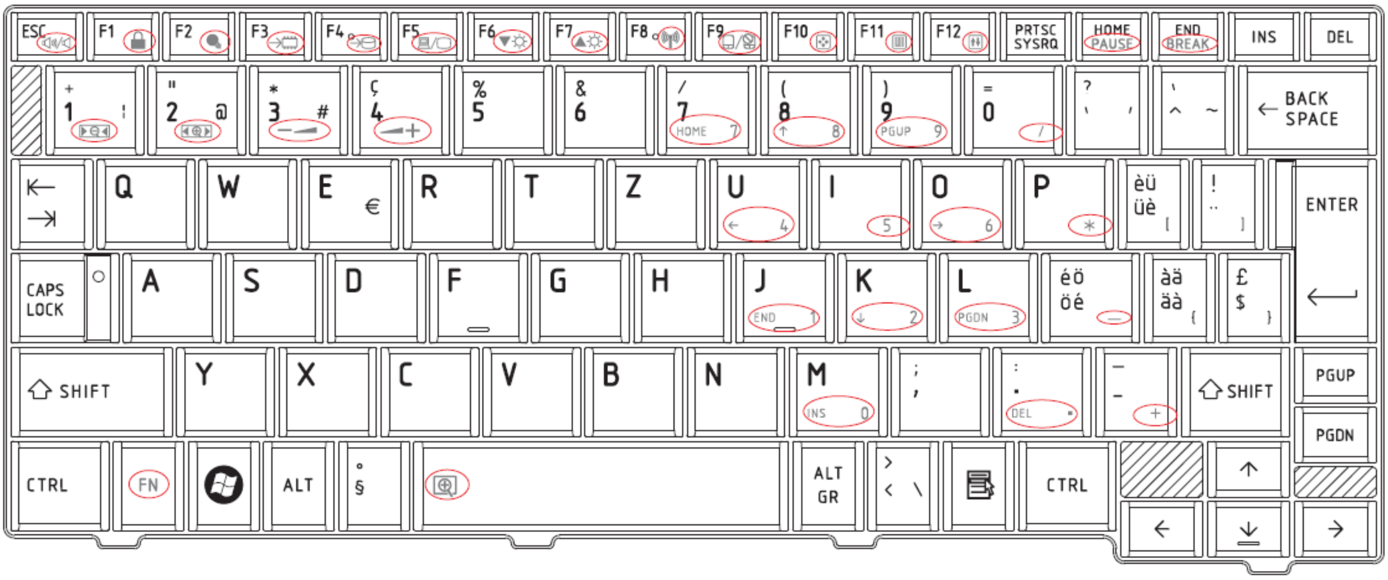


Figure SW keyboard

10. Arabic (ARE) Keyboard

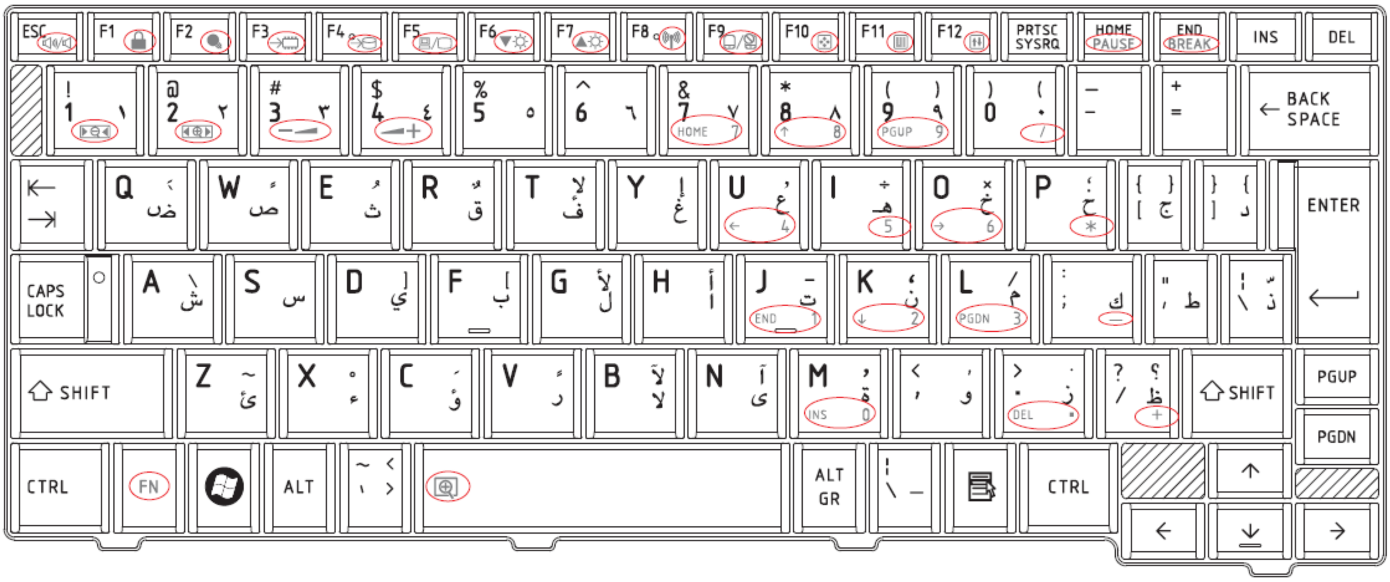


Figure ARE keyboard

11. Czech (CZ) Keyboard

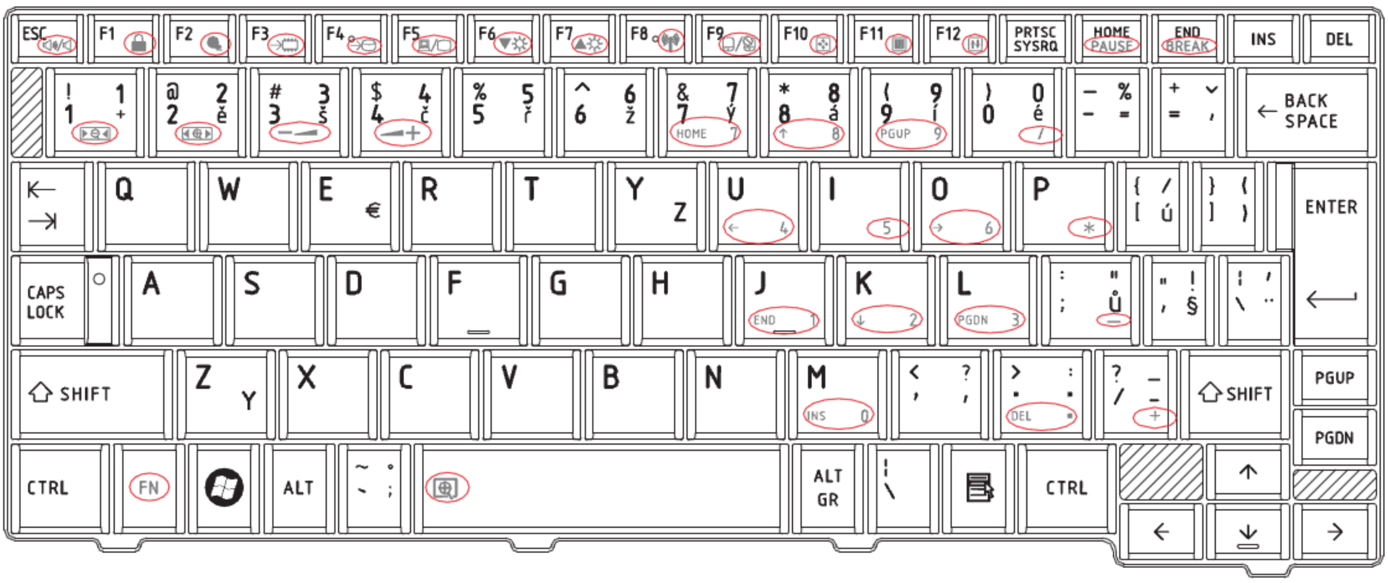


Figure CZ keyboard

12. Russian (RU) Keyboard

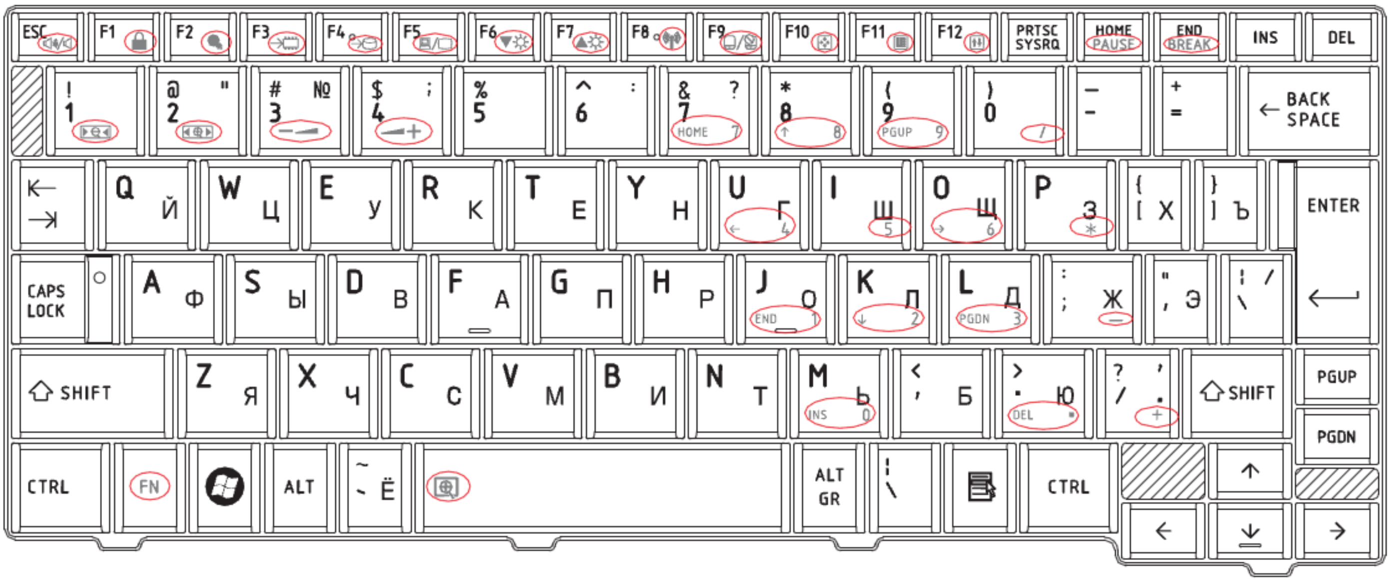


Figure RU keyboard

13. Portuguese (PO) Keyboard

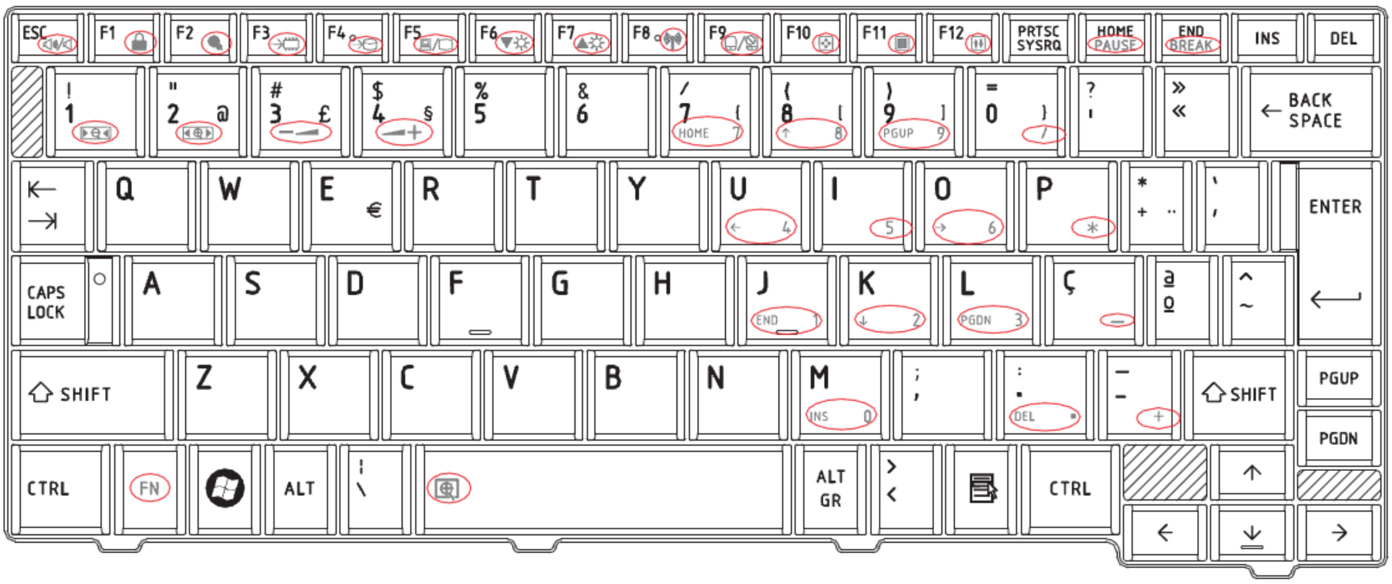


Figure PO keyboard

14. Slovakian (SL) Keyboard

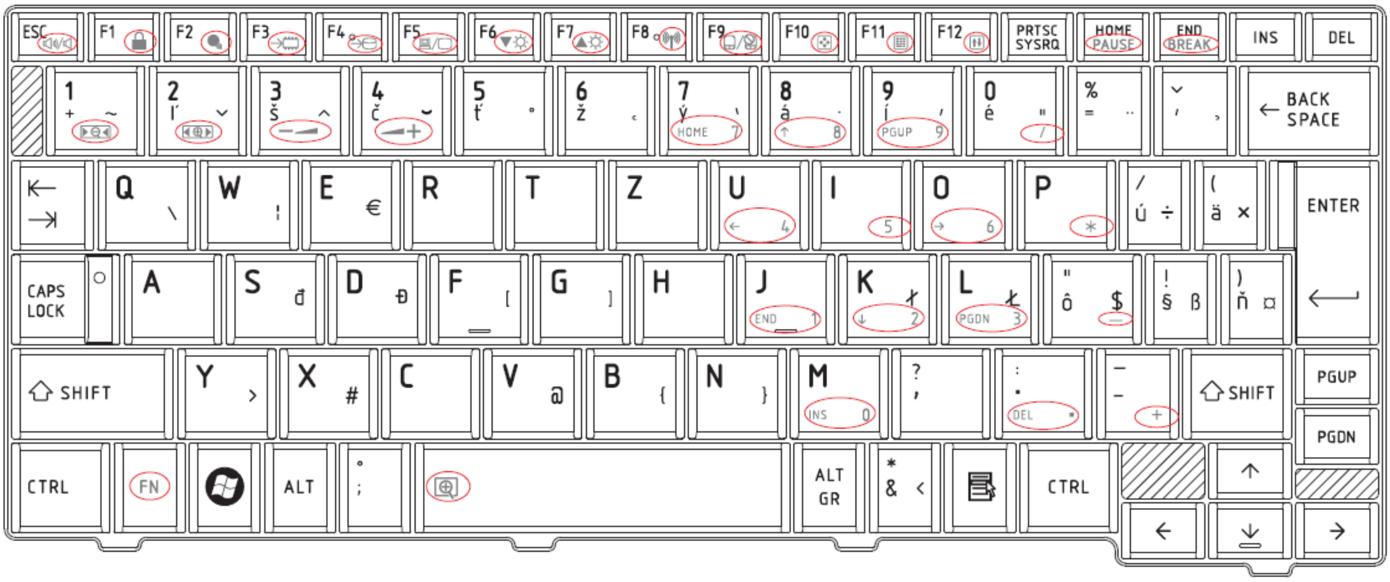


Figure SL keyboard

15. Italian (IT) Keyboard

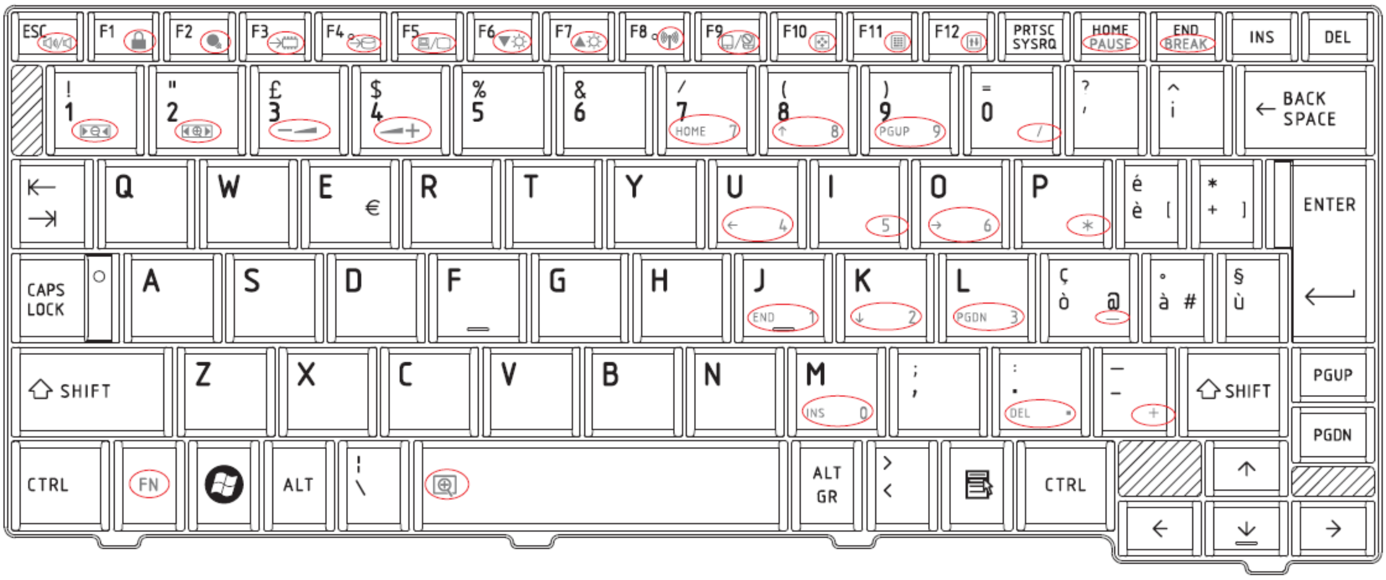


Figure IT keyboard

16. French (FR) Keyboard

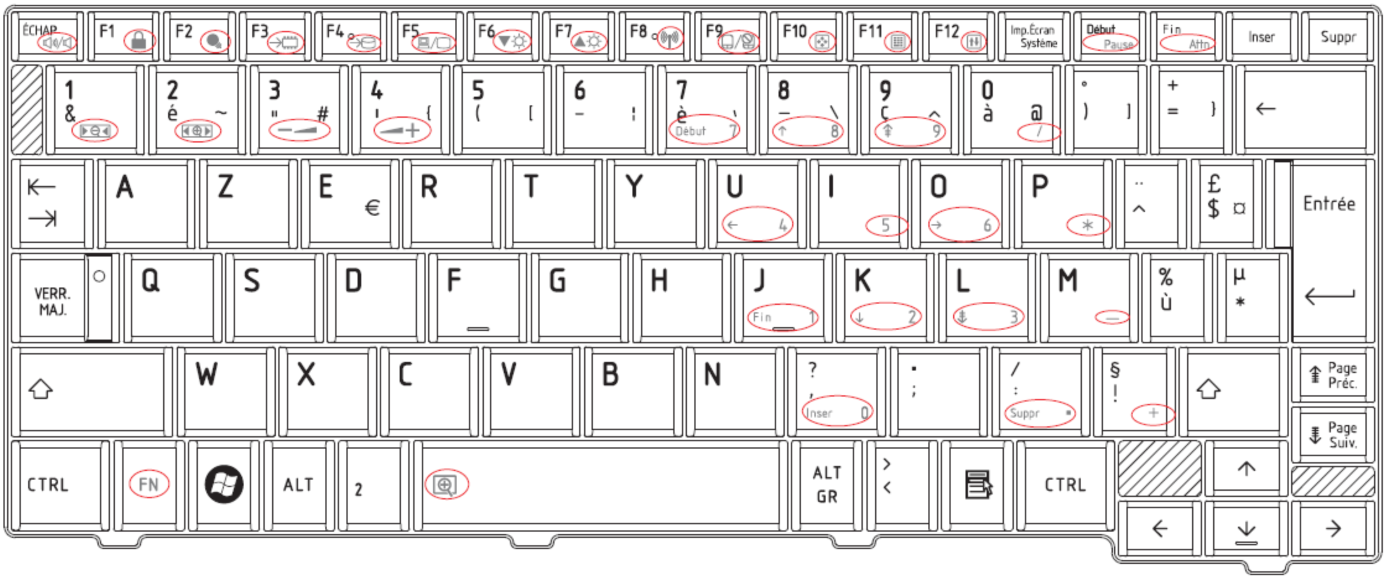


Figure FR keyboard

17. German (GR) Keyboard

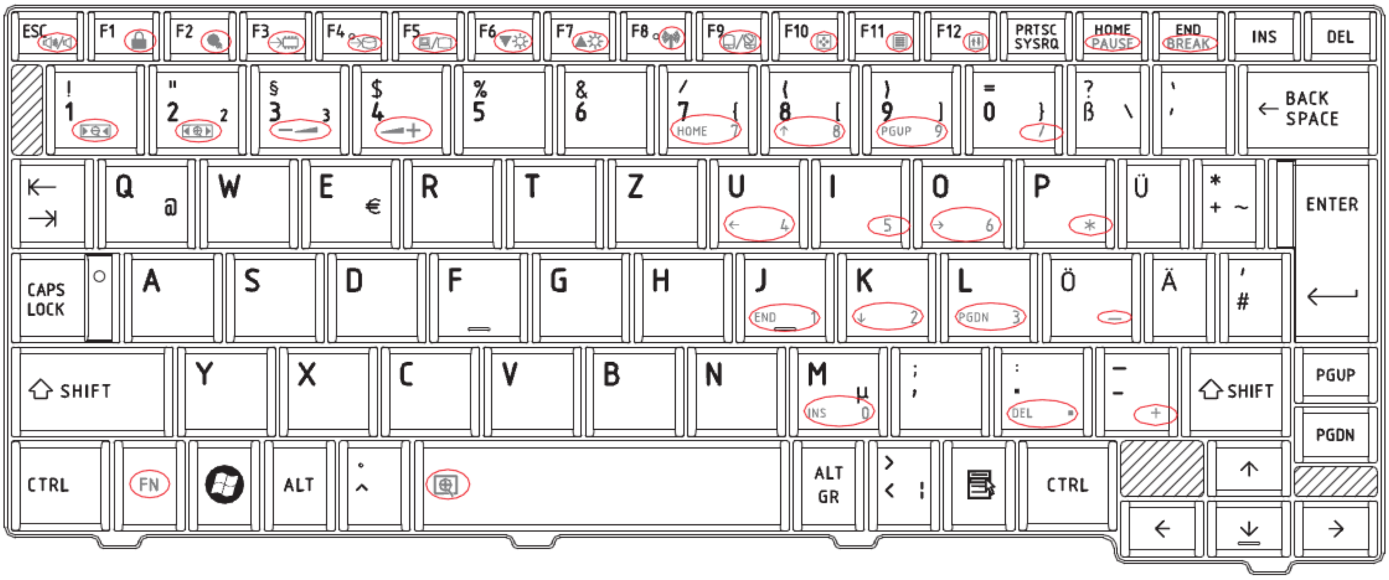


Figure GR keyboard

18. Greek (GK) Keyboard

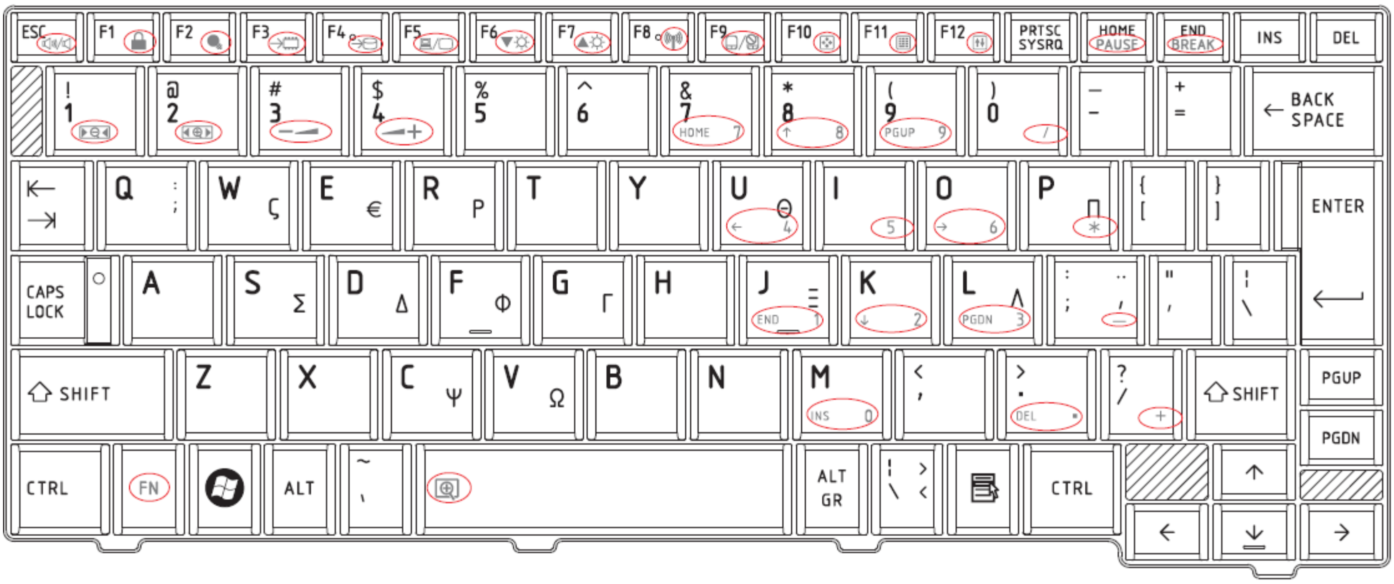


Figure GK keyboard

19. Hungarian (HG) Keyboard

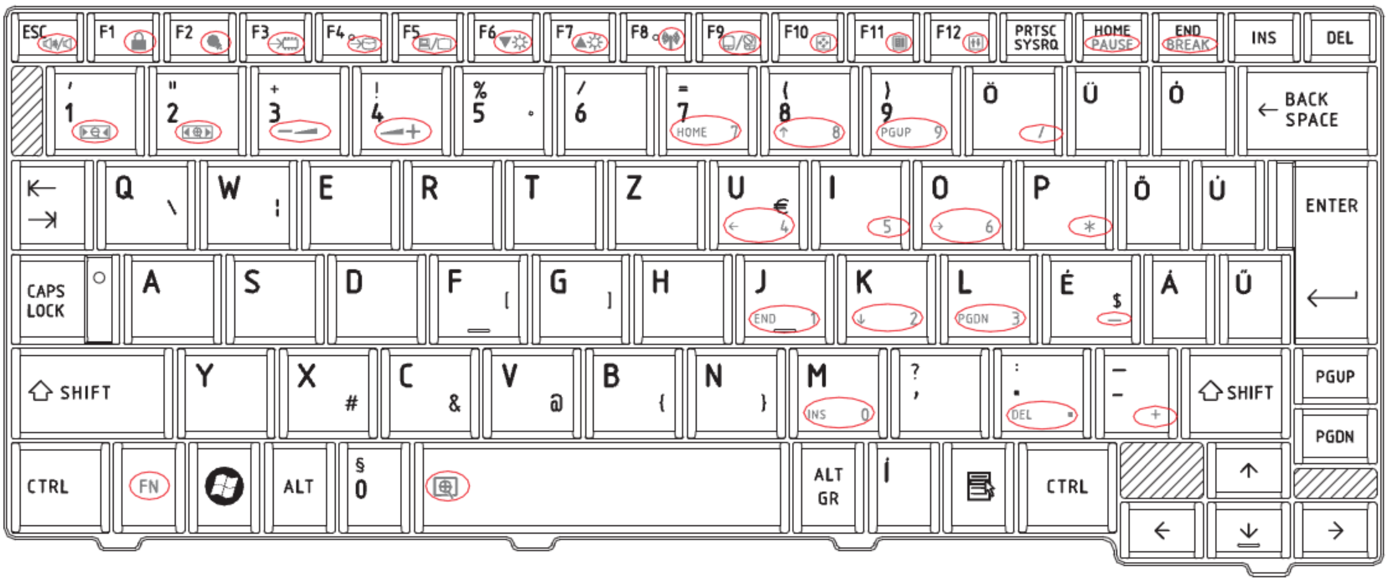


Figure HG keyboard

20. Spanish (SP) Keyboard

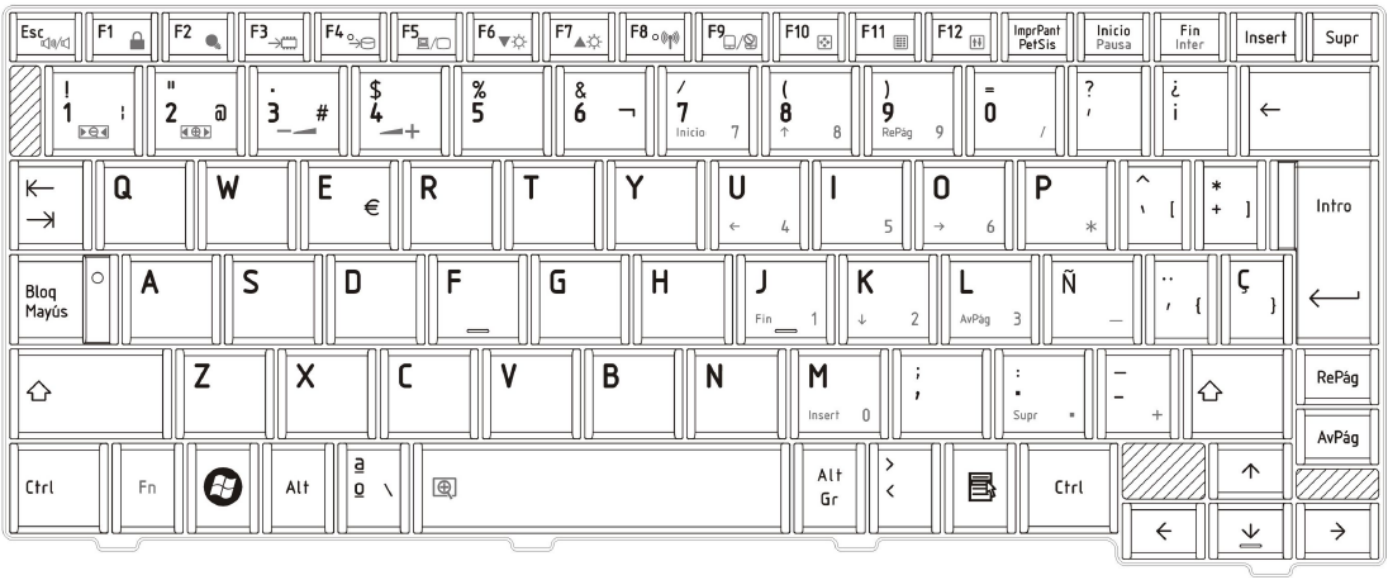


Figure SP keyboard

21. Turkish (TR) Keyboard

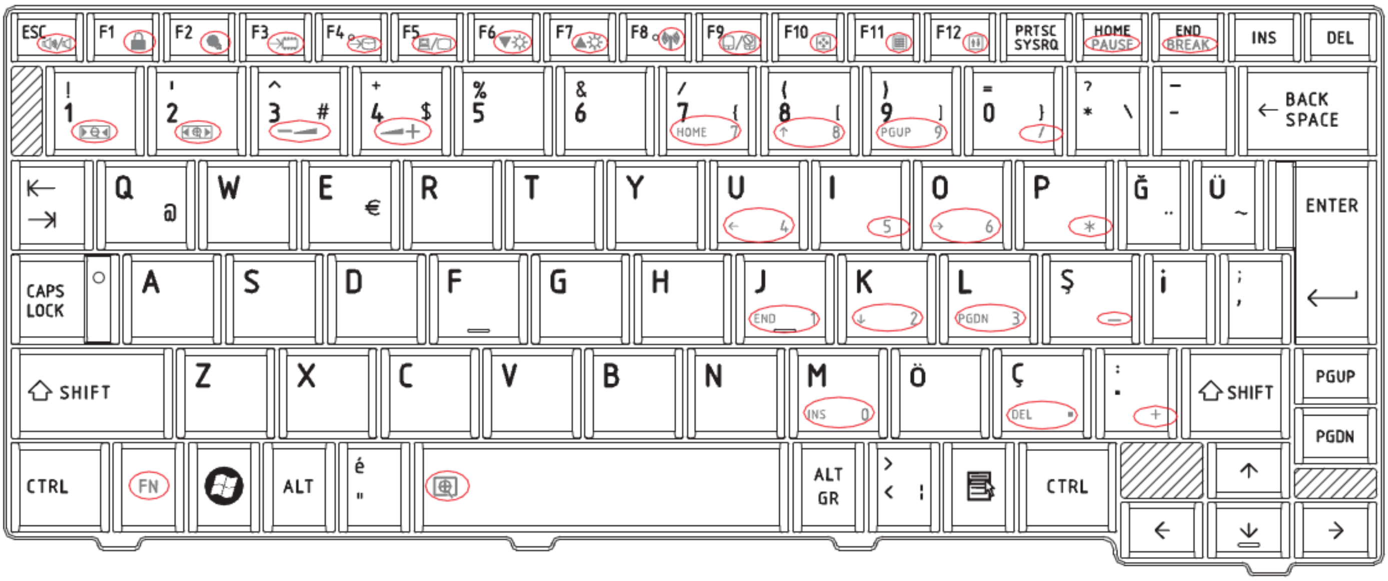


Figure TR keyboard

22. Turkish F (TF-F) Keyboard

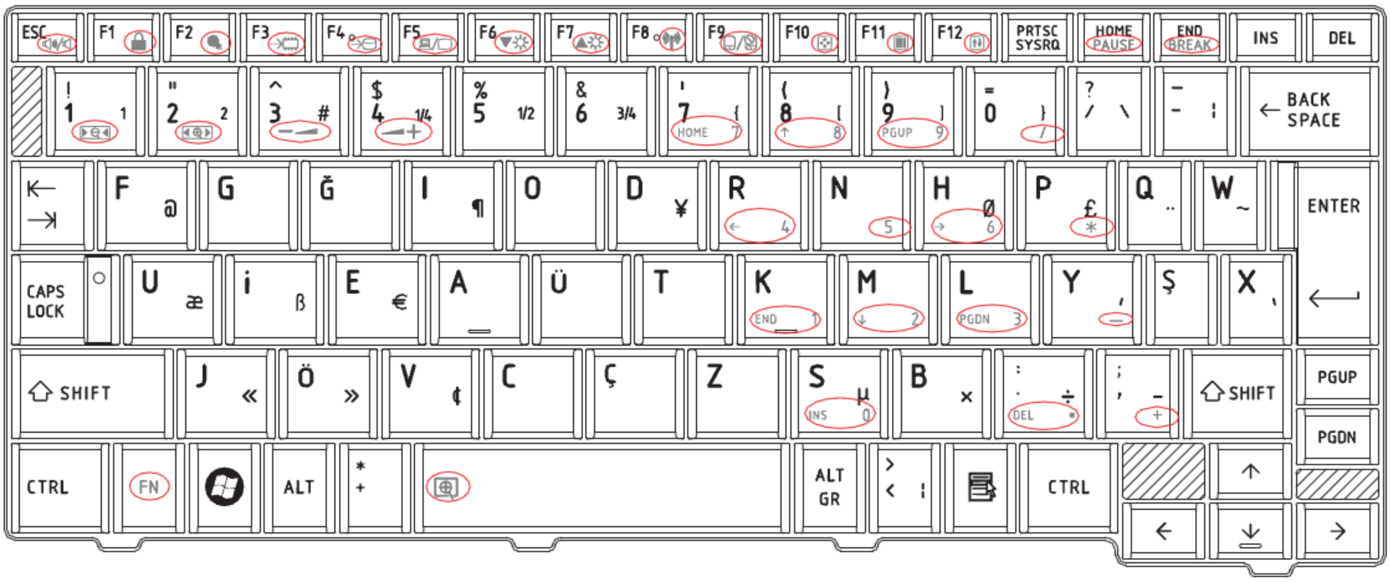


Figure TF-F keyboard

23. Swedish (SD) Keyboard

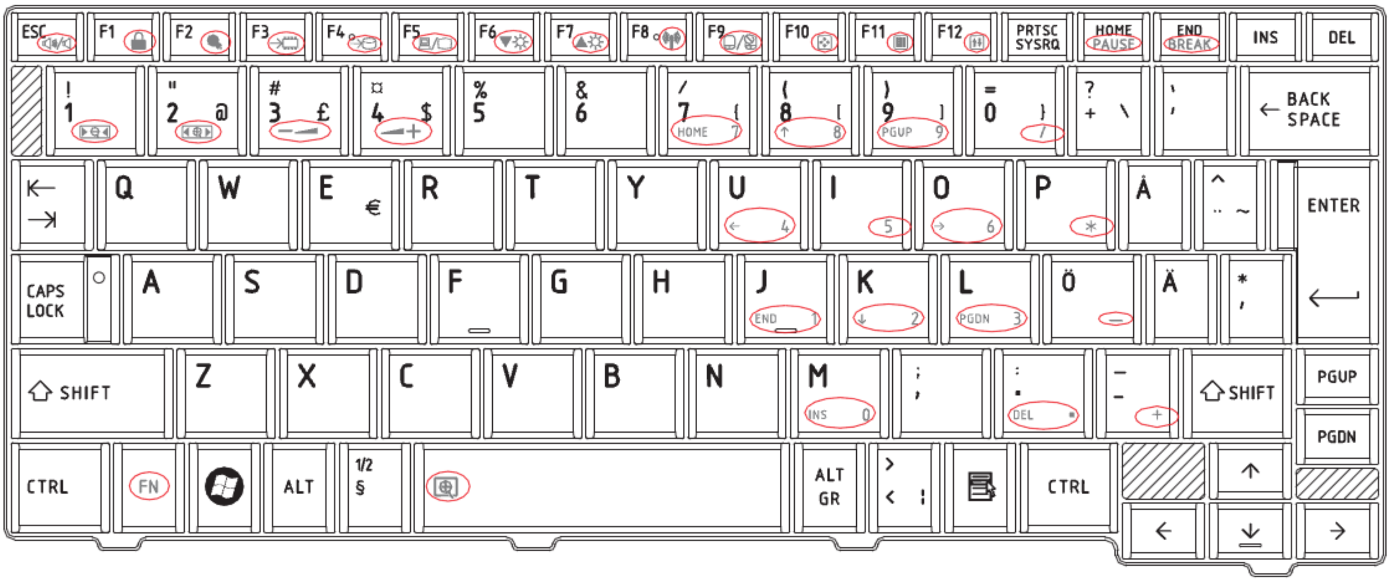


Figure SD keyboard

24. Belgian (BE) Keyboard

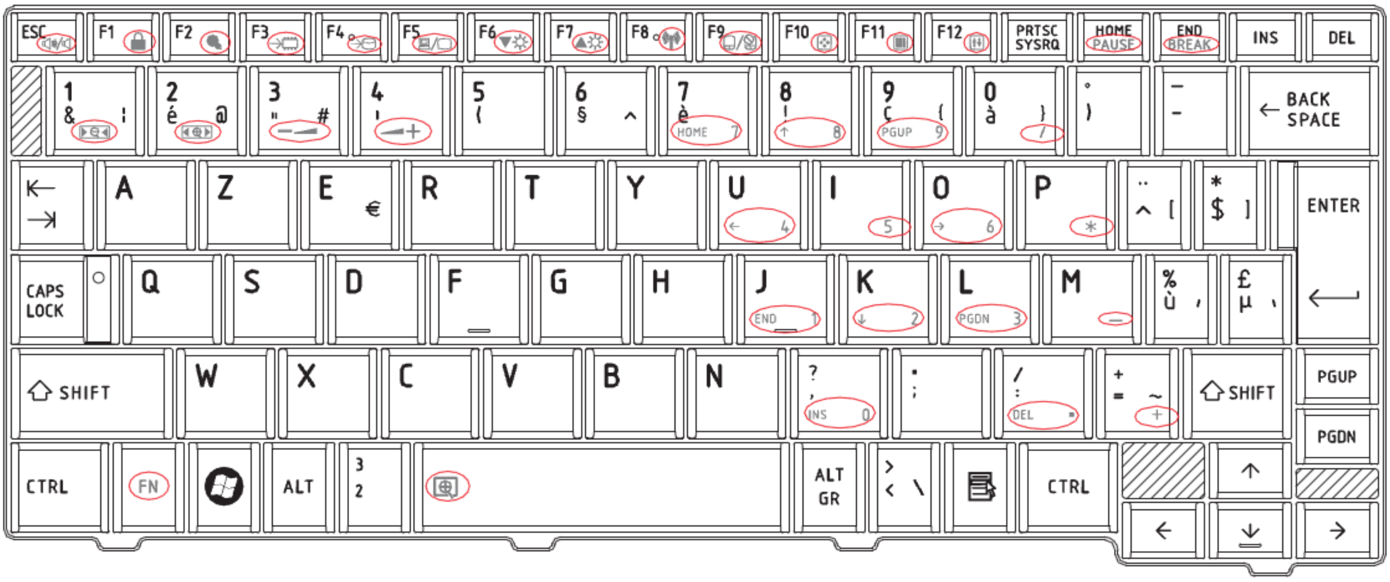


Figure BE keyboard

25. Yugoslavian (YU) Keyboard

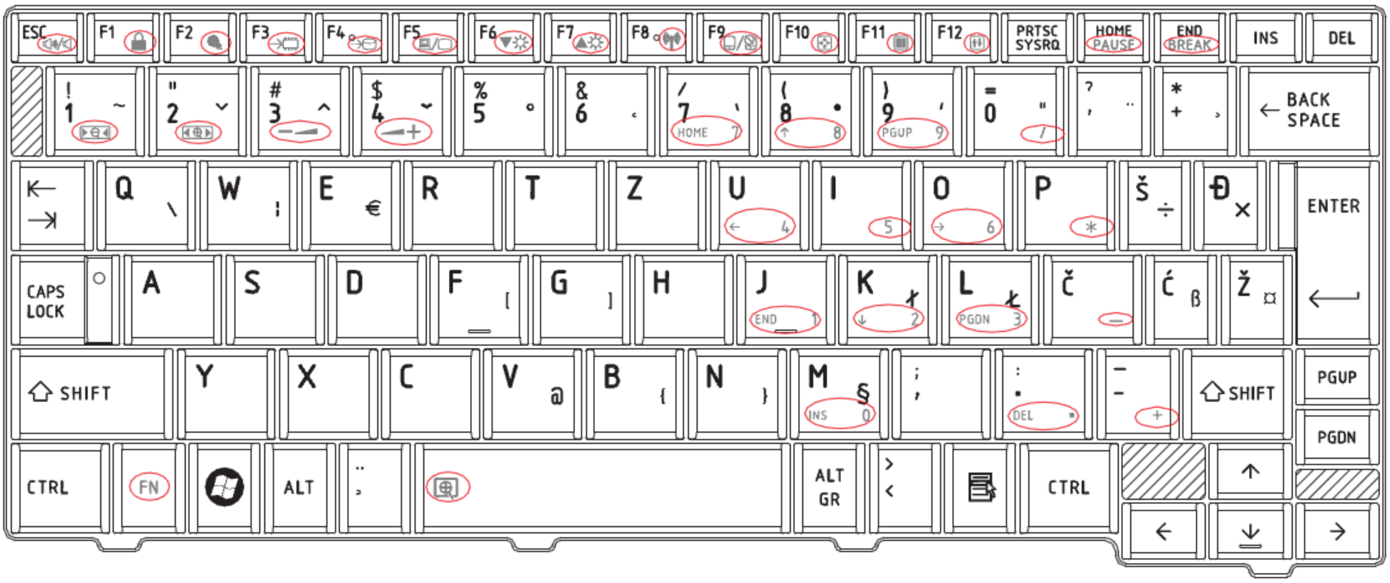


Figure YU keyboard

26. Norwegian (NW) Keyboard

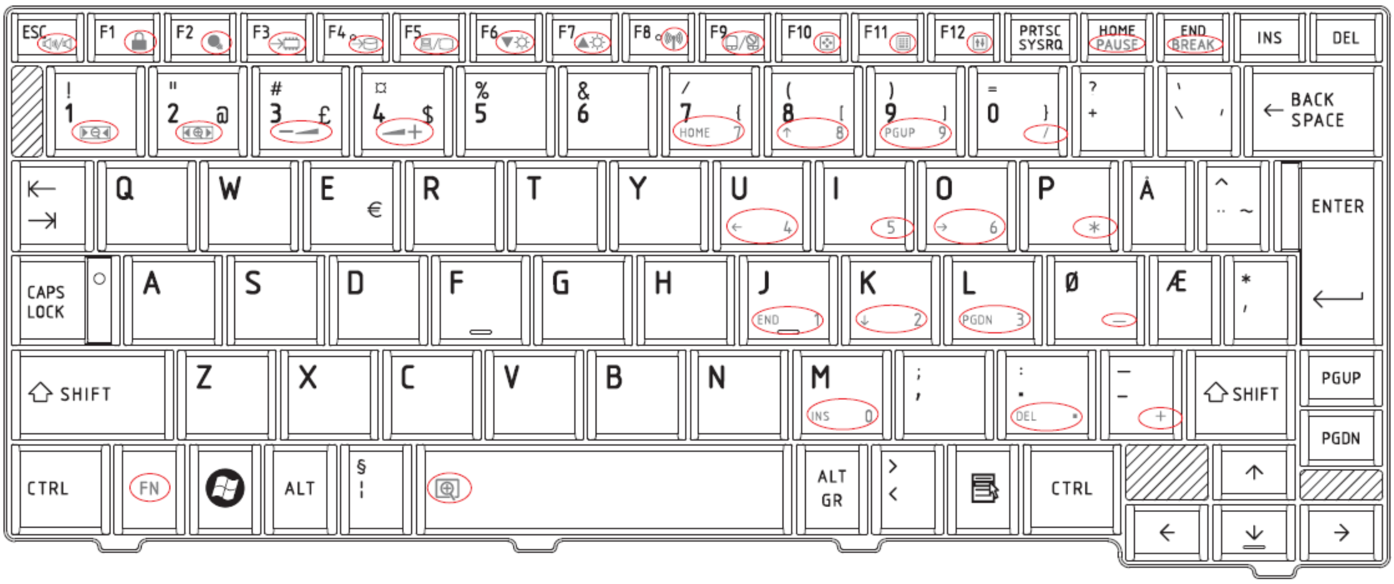


Figure NW keyboard

27. Scandinavian (ND) Keyboard

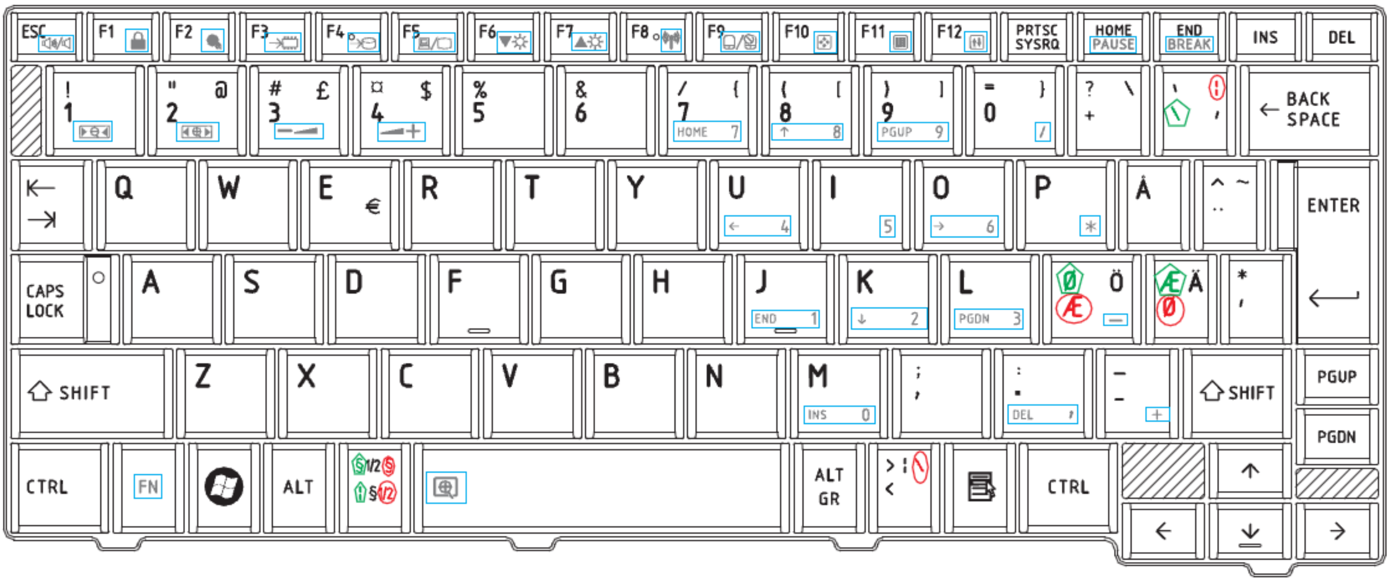


Figure ND keyboard

28. Canadian Multinational (AC) Keyboard

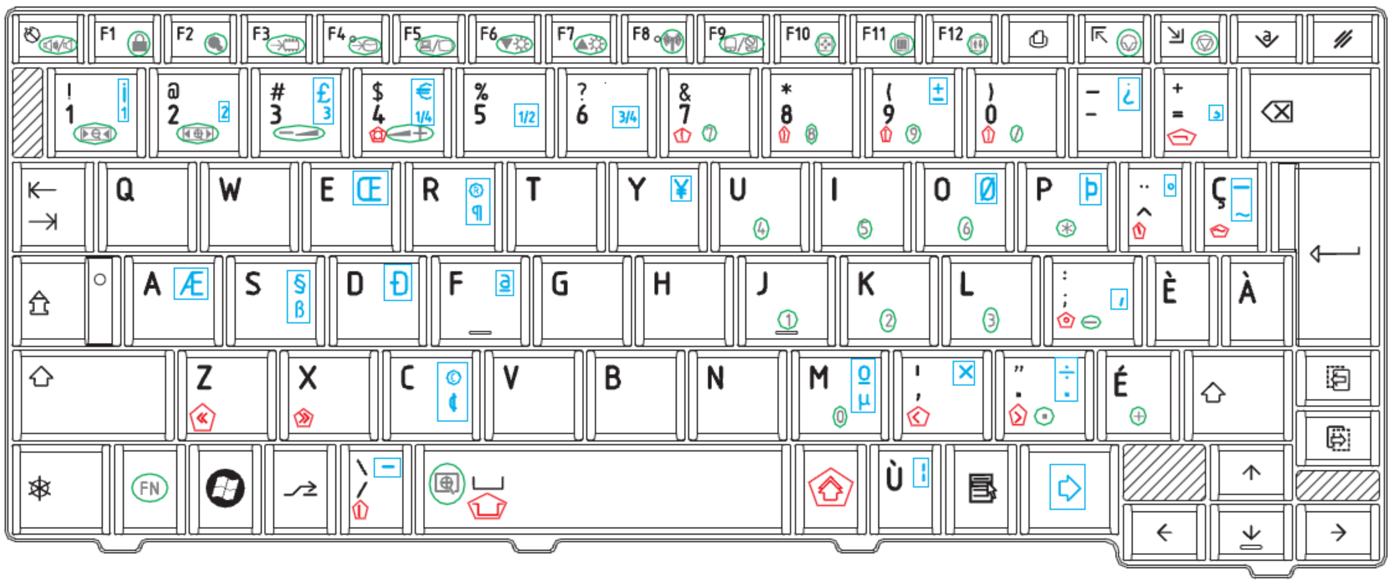


Figure AC keyboard

29. Canadian Bilingual (CB) Keyboard

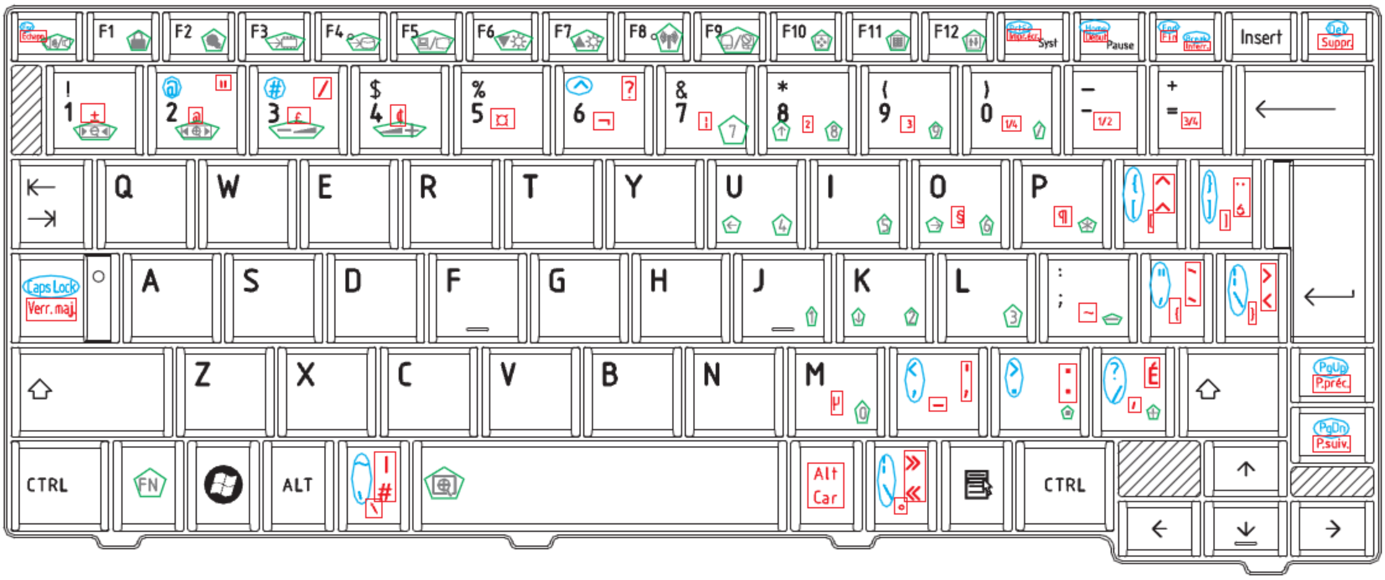


Figure CB keyboard

30. Romania (RO) Keyboard

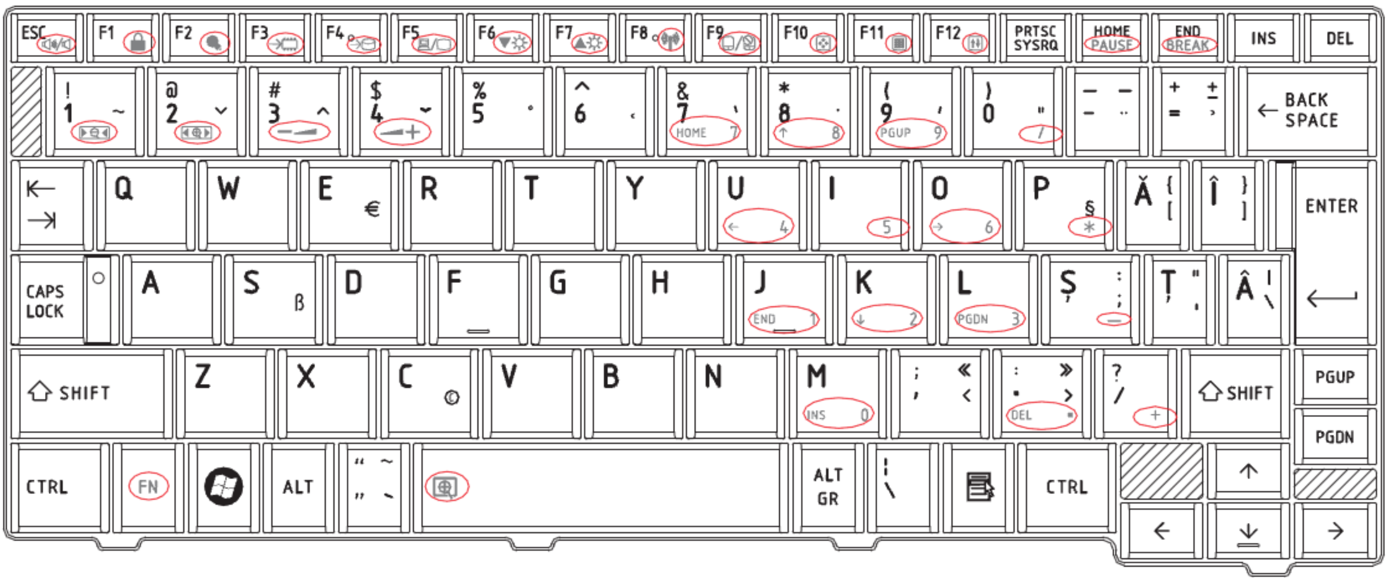


Figure RO keyboard

31. Bulgaria (BU) Keyboard

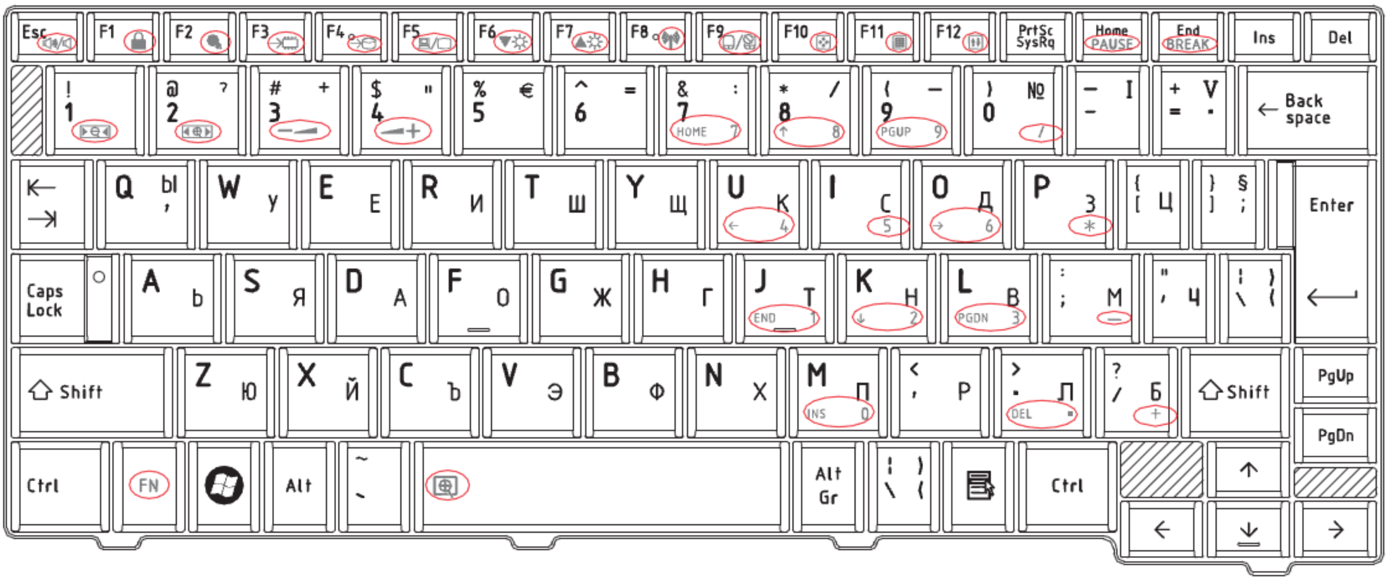


Figure BU keyboard

32. Japanese (JP) Keyboard

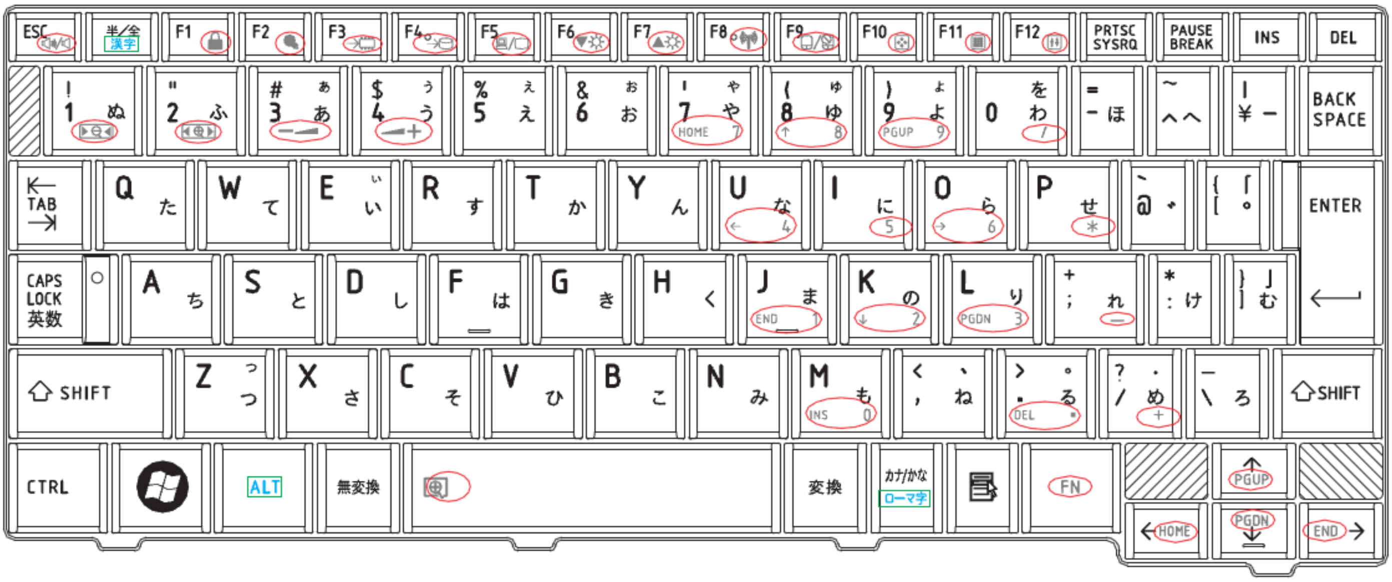


Figure JP keyboard

Appendix F Series Screw Torque List (PAV10)

Table F-1 Series Screw Torque List

SCREW P/N	SCREW SPEC	Q'ty	LOCATION	SCREW TORQUE
LCD ASSY				
MAAA00153G0	M2x3.0 (Black)	4	LCD HINGE BRK ASSY L&R TO LCD PANEL 17W"	1.2~1.5Kgf.cm
MA000005WG0	M2.5x3 (Black)	4	LCD HINGE L&R TO LCD COVER	2.5~3.0Kgf.cm
MA00000CKG0	M2.5x5 (Silver)	2	LCD BEZEL TO COVER	2.5~3.0Kgf.cm
MB				
MA000008YG0	M2x5 (NI 白鎳)	2	HDD(H=10.2mm) CONNECTOR TO MB	1.5~2.0Kgf.cm
MA000008YG0	M2x5 (NI 白鎳)	2	BATTERY CONNECTOR TO MB	1.5~2.0Kgf.cm
MAAA00153G0	M2.0x3 (black)	2	WLAN CARD TO MB STANDOFF	1.5~2.0Kgf.cm
THERMAL MODULE				
MA000005WG0	M2.5x3 (black)	3	THERMAL MODULE TO MB	2.0~2.5Kgf.cm
HDD ASSY				
MCDK03030G0	M3x3 (BZn 黑鎳)	4	HDD BRACKET TO HDD	2.0~2.5Kgf.cm
LOG UP				
MAC925025G0	M2.5x2.5 (black)	2	TP BRACKET TO LOG UP	2.0~2.5Kgf.cm
LOG LOWER ASSY				
MA000009KG0	SPEAKER SCREW	2	SPEAKER TO LOG LOW	2.5~2.5Kgf.cm
LOGIC ASSY				
MACK25040G0	M2.5x4 (Black)	2	MB TO LOG LOW	2.0~2.5Kgf.cm
MACK25040G0	M2.5x4 (Black)	2	LOG LOW To LOG UP (Rear)	2.5~3.0Kgf.cm
MA0000062G0	M2.5x6 (Black)	5	LOG LOW TO MB TO LOG UP	2.5~3.0Kgf.cm
MA0000062G0	M2.5x6 (Black)	1	LOG UP TO MB TO LOG LOW	2.5~3.0Kgf.cm
MA0000062G0	M2.5x6 (Black)	3	LOG UP TO LOG LOW	2.5~3.0Kgf.cm
MA0000062G0	M2.5x6 (Black))	2	LOG LOW TO KEYBOARD	2.0~2.5Kgf.cm
MA0000066G0	M2.5x4 (Black))	2	HDD DOOR TO LOG LOW	2.5~3.0Kgf.cm
MA000009TG0	M2.5* 2.2+1.8L(Black)	1	RAM DOOR TO LOW (FIX ON DOOR)	2.0~2.5Kgf.cm

LOGIC & LCD ASSY				
MA0000062G0	M2.5x6 (Black)	4	HINGE BRACKET TO LOGIC	2.0~2.5Kgf.cm
MACK25040G0	M2.5x4 (Black)	3	LOG LOW TO UP HINGE COVER	2.0~2.5Kgf.cm

Appendix G Reliability

The following table shows MTBF (Mean Time Between Failures) for each component.

Table G-1 MTBF

Component	Time (hours)
LCD	10,000
Keyboard	64400
HDD	300,000
Optical (DVD/CD) drive	60,000
AC adaptor	50,000